

# Tier 1 Forest and Wetland Mitigation and Enhancement Plan



# **TIER 1 FOREST AND WETLAND MITIGATION AND ENHANCEMENT PLAN**

## **Construction of I-69 From Evansville to Indianapolis, Indiana**

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# TIER 1 MITIGATION AND ENHANCEMENT PLAN

The following mitigation plan is offered for preliminary review on potential impacts to "Waters of the United States" and forestland by the construction of I-69 from Evansville to Indianapolis, Indiana. This mitigation and enhancement plan is conceptual and compensatory for probable forest and wetland losses in Alternative 3C within the Tier I FEIS Analysis.

The Memorandum Of Agreement Between The Department of the Army and The Environmental Protection Agency pertaining to The Determination of Mitigation Under The Clean Water Act Section 404 Guidelines updated on December 31, 2002 states that appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts which remain after all appropriate and practicable minimization has been required. Compensatory actions (e.g., restoration of existing degraded wetlands or creation of man-made wetlands) should be undertaken when practicable, in areas adjacent or continuous to the discharge site (on-site compensatory mitigation). If onsite compensatory mitigation is not practicable, off-site compensatory mitigation should be undertaken in the same geographic area if practicable (i.e., in close proximity and, to the extent possible, the same watershed). In determining compensatory mitigation, the functional values lost by the resource to be impacted must be considered. Generally, in-kind compensatory mitigation is preferable to out-of-kind. There is continued uncertainty regarding the success of wetland creation or other habitat development. Therefore, in determining the nature and extent of habitat development of this type, careful consideration should be given to its likelihood of success. Because the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, restoration should be the first option considered.

The resources identified in this Tier 1 are based on the statewide databases. Wetland inventories are based upon NWI (National Wetland Inventory) mapping from the U.S. Fish & Wildlife Service. While these databases are not 100% accurate, they usually identify larger areas, and thus result in higher wetland acres than those that will be determined during Tier 2 analysis. The Tier 2 analysis for wetlands will require a traditional site-specific wetland determination and delineation conducted from site surveys. Similarly, other resource impacts will be developed to the traditional level of investigation at either the Tier 1 or the Tier 2 studies.

Tier I Analysis using NWI maps show that this project may impact 65 acres of wetland forests, 5 acres of wetland scrub / shrub, 5 acres of wetland emergent, and 1,062 acres of upland forests. Replacement ratios for wetland forests, wetland scrub/ shrub and upland forests are 3:1, and emergent wetlands are 2:1. These numbers are slightly different than the numbers found in the DEIS because of the elimination of the variation at Mann Road and I-465, the use of the far east option around Washington, Indiana and some slight shifts in the alignment in other areas as identified in the FEIS. Potential wetland impact sites are in Appendix B-1.

In this Tier 1 Forest and Wetland Mitigation and Enhancement Plan, the total area needed for wetland replacement is 220 acres, and upland forest replacement is 3,186 acres. In addition, a total of 55 acres will be needed for buffers around all wetland mitigation sites. In summary, total mitigation that may be needed for I-69 from Indianapolis to Evansville is 3,461 acres with the majority (85-90%) in upland forest losses. Additional acres would be required for access easements (ingress and egress) to mitigation sites for construction and monitoring. If all 17 mitigation sites were implemented, the total amount of mitigation would be 5,230 acres which is 1,769 acres more than needed. These figures are based on Tier 1 data. During Tier 2 studies, these numbers will be refined as appropriate.

Mitigation Themes for I-69 Evansville to Indianapolis include the Restoration / Replacement Theme, Conservation / Preservation Theme, and Educational / Research Theme.

- The Restoration / Replacement Theme include replacement of wetlands in the same watershed at ratios described in the Wetland MOU dated January 28, 1991. Forest mitigation will include replacement of forest losses at a 3:1 ratio within the Alternative 3C study area. Mitigation sites will be connected to existing wetlands and forests and provided habitat for both federal and state listed species.

- The Conservation / Preservation Theme would include purchasing property and placing such properties into a land management classification in perpetuity (e.g., forest legacy) and provides opportunities for protection of a natural resource (e.g., Indiana bat, bald eagle, and unique habitats – caves, springs, barrens / glades, prairie remnants, old growth forests). Such mitigation sites will be purchased at fair market value or easement granted from a “free willing” seller(s). Thereafter, properties will be donated to an appropriate governmental environmental agency and registered as needed in a program, nature preserve, and others. The installment of cave gates, as appropriate, may be considered under this theme.
- The Educational / Research Theme include a number of resources used to educate governmental leaders and the public on environmental stewardship and our historical heritage in Indiana. Some such possible actions are:

Context Sensitive Solutions. Some context sensitive solutions may be a variable width median for the roadway keeping with a natural vegetation theme; wildflower plantings for roadsides, rest areas, and overlooks; the construction of borrow pits that have shallow shores; rest areas with various amenities such as short hiking trails, bird and bat boxes, and trail signs; the location of rest areas and overlooks in scenic areas as provided by educational venues; complete spanning of major rivers (e.g., Patoka River and East Fork of the White River) so as to provide wildlife corridors and minimize impacts to the varying habitats and species; and in areas with oxbows that dry up, consideration for the excavation of such areas and connecting them to the main river. Coordination with review agencies on these and other context sensitive solutions is recommended.

Construction of an Interchange for Access to a Visitor’s Center at the Patoka River National Wildlife Refuge, and Development of Habitat for Waterfowl Utilizing the Refuge. This could include the construction of trails and habitat improvement structures, and excavation to enhance aquatic and terrestrial habitat. The intent is to add to existing high biodiversity in the Patoka River bottoms, and to provide an education opportunity for visitor’s to learn of plants, animals and habitats.

Possible Funding. Possible funding may be available for threatened and endangered species studies, environmental monitoring and research, natural history and cultural resources studies, and cost for publishing and distribution of information. Publications may be made available on a county, regional and state basis, and public notice of research grants, as appropriate, will be advertised and competitive.

GIS Information. Promote the use of the GIS as a planning tool. GIS maps and databases would be made available to the public for varying uses on a local, county and regional basis. Such information will benefit land use policy decisions.

## **I. MITIGATION SITES IN THE ACTION AREA**

The Action Area is defined by regulation as all areas to be affected directly or indirectly by the Federal Action and not merely the immediate area involved in the action (50 CFR – 402.02). This analysis is not limited to the “footprint” of the action nor is it limited by the Federal agency’s authority. Rather, it is a biological determination of the reach of the proposed action on listed species. For the endangered Indiana bat, two seasonal Action Areas are defined, summer and winter. The Summer Action Area is a 5-mile band, 2.5 miles either side of the proposed centerline, along the entire length of the proposed project. The Winter Action Area is a 5-mile radius circle around each of the ten known hibernacula within 5 miles of the proposed project corridor. For the threatened bald eagle, the Action Area is a band that includes 1 mile on either side of the proposed I-69 corridor, while the Action Area for the endangered eastern fanshell is a band that includes 1.5 miles downstream and 0.5 miles upstream of the proposed I-69 corridor over the East Fork of the White River.

This document was originally developed as part of the Biological Assessment, but it also serves as a broader function in providing for wetland and forest enhancement and mitigation as a whole. Mitigation sites in this document should be viewed as an INDOT “menu” of possible mitigation sites. Not all of these mitigation sites may be selected, and others could be added.

Mitigation sites within the Action Area include Pigeon Creek, Patoka River Bottoms, East Fork White River, Plainville Sand Dune Region, White River (Elnora), First Creek, American Bottoms, Sexton Springs Cave, Ray’s Cave, Lake Monroe, Garrison Chapel Valley, Beanblossom Bottoms, White River (Gosport), Bradford Woods, and White River

(Blue Bluff). The Indiana Department of Transportation may purchase such mitigation sites or others at a fair market value or purchase easements from willing sellers. Once INDOT has purchased, improved, and/or enhanced a site, they may donate it to an appropriate governmental agency. These locations were chosen based on a wide variety of existing wetlands, karst features, old growth forests, and unique habitat for TES species, along with connection of these sites with federal, state, and local environmental agencies (Appendix B-2). For detailed maps showing forest and wetland impacts associated with Alternative 3C, please refer to Appendix B-4.

The Pigeon Creek bottoms mitigation site is expected to be between Elberfeld and Mackey (Appendix B-3 – Site #1). This area is attractive for it harbors many plants and animals, including the swamp rabbit, copperbelly watersnake, great blue heron rookeries, and a mosaic of wet-to-dry habitats. The proposed design of this mitigation site would be a wetland woods of bald cypress and swamp cottonwood with wet holes of broad-leaved emergents bordered by buttonbush, and on slightly higher elevations, southern cane, and bottomland woods of oak and hickory. Such plantings are to extend existing wetlands and woods for greater core forest and TES habitat. This mitigation site would provide an increase in summer roosting habitat for the Indiana bat.

The Patoka River Bottoms mitigation site is expected to be within the vicinity of Patoka River National Wildlife Refuge near the area crossed by Alternative 3C (Appendix B-3 – Site #2). These bottoms showed the highest biodiversity crossed by Alternate 3C and the only federally listed species (i.e., Indiana bat). Historically, much of the Patoka River bottoms were altered by agriculture and mining; however, many opportunities exist today for mitigation. The proposed design is a shallow water, slough-like habitat open to view from a proposed visitor's center. Such a habitat would attract ducks and geese along with various-sized wading birds. Of special interest would be whooping and sandhill cranes. A cane marsh would be located at a slightly higher elevation with prairie vegetation at even higher elevations. Bottomland woods of oak and hickory will be provided, as appropriate, for a visual barrier where needed. This mitigation site would provide an increase in summer roosting habitat for the Indiana bat. An interchange for the refuge is proposed at CR 125 S.

The mitigation site near the East Fork of the White River is expected to be in the vicinity of Petersburg (Appendix B-3 – Site #3). This mitigation site would be planted as a flatwoods of oak and hickory with numerous openings planted in prairies and cedars with hawthorns, and small pockets (springs) of water with wetland plants. This site would be connected to the banks of the East Fork and provides an excellent opportunity for developing habitat for the Indiana bat, bald eagle perches for nesting and feeding, and water quality improvements. The proposed design for this mitigation site would be a savannah-type habitat, i.e., an open upland to bottomland woods with many clearings planted with prairie grasses and plants of sandy soils. The edge of these woods and open clearings should be planted with cedars and hawthorns for use by loggerhead shrike. Near the East Fork, raptor nesting platforms should be erected for use by various birds of prey. Dead snags should be protected for use by the Indiana bat, evening bat, and other species. This mitigation site would provide an increase in feeding and nesting perches for the bald eagle and increase summer roosting habitat for the Indiana bat. Improving water quality in this area could increase the potential for mussels in the East Fork of the White River.

The Plainville Sand Dune Region mitigation site may be near Thousand Acre Woods, Badger Badlands, Sand Woods, or Capeheart Sandflats (Appendix B-3 – Site #4). These areas are associated with the Plainville Sand Dune Region, a small but unique area of wind blown sand dunes east of the Wabash and White Rivers. The barrens natural community type, now virtually gone from the landscape, was predominant on ridges and well drained sites, and swamp, marsh, and wet prairie occupied swales. Many opportunities exist today for mitigation in these areas. The proposed design for this mitigation site would be a mosaic of prairies and bottomland woods habitat that would increase core forest habitat and habitat for the loggerhead shrike. Such ecosystems would attract numerous species. Of special interest would be yellow-billed cuckoo, Kentucky warbler, crested flycatcher, and the yellow-breasted chat. Bottomland woods will be planted with oak and hickory, while prairies will have bluestem interspersed with red cedars and hawthorns. This mitigation site would increase the amount of summer roosting habitat for the Indiana bat.

The White River (Elnora) mitigation area is expected to be along the White River near Elnora (Appendix B-3 – Site #14). This environmentally sensitive area is unique because of its backwater sloughs, oxbow wetlands, and floodplain forest remnants. Oxbows like those in this area are important for the unique plants and animals that utilize them. They also offer an ecosystem connected with the White River. Mussels, fish, amphibians, reptiles, birds, and mammals depend upon these areas for survival. Many opportunities exist for mitigation in this area. The proposed mitigation design is to restore wetlands and bottomland woods and provide habitat for aquatic and terrestrial TES species. Similarly, some oxbows that dry up in the mitigation site could be dug and connected to the West Fork of the White River. Other oxbows

would be left in existing conditions. This mitigation site would provide summer roosting habitat for the Indiana bat and increase bald eagle nesting and feeding habitats

The First Creek mitigation area is expected to be near Newberry (Appendix B-3 – Site #6). This sandy lowland area showed a high potential for summer roosting habitat for the Indiana bat. The area is a mixture of bottomland hardwoods interspersed with grazing and surround by agriculture. Opportunities for mitigation in this area are excellent. The proposed design of this mitigation site would be bottomland woods and forested wetlands to provide habitat for the Indiana bat and other TES species.

The American Bottoms mitigation site is expected to be in Greene County near Hwy 54 between the towns of Cincinnati and Bloomfield. This area is unique in its geological features and has a number of springs and caves. Although it is not well known, the American Bottoms incorporates approximately 5,200 acres. The concept of this proposed mitigation site is to protect this area from encroachment by development and the protection of its unique karsts features. The purchasing of this property would protect many species dependent upon karst.

The Sexton Springs Cave mitigation site is Sexton Spring Cave (if possible), and / or surrounding areas (Appendix B-3 – Site #9). This would be an excellent opportunity for gating this cave and protecting the cave and its vertebrate and invertebrate inhabitants from human disturbances. Forest mitigation will protect existing woods and upland and bottomland woods can be planted. The proposed design of this mitigation site is an open, upland woods with many clearings. Some of the clearings will be wetlands, while others will be planted as wet-to-dry prairies. Properties purchased are expected to have some 50% moderate to older sized timber. The concept is to provide habitat that will provide food for the Indiana bat and core forest dependent species. Similarly, the cave will be purchase (if possible), and the opening gated to exclude human disturbances. This mitigation site would provide both summer and winter habitat for the Indiana bat.

The Ray's Cave mitigation site (if possible) is privately owned property which includes Ray's Cave (Appendix B-3 – Site #10). This cave is a Priority I hibernacula for the Indiana bat. Purchasing this property would be an excellent opportunity to gate this cave and protect its vertebrate and invertebrate inhabitants from human disturbances. It is expected that this property would be placed within the Forest Legacy Program. The proposed design concept of this mitigation site is to protect this cave from encroachment by development and to protect mature timbered parcels for core forest. This cave may be purchased and the openings gated to exclude human disturbances. This mitigation site would provide both summer, winter, and autumn/spring habitat for the Indiana bat.

The Lake Monroe mitigation site would border Lake Monroe (Appendix B-3 – Site #11). This site is within the Hoosier National Forest purchase boundary and within 2 miles of Leonard Springs Cave, a Priority III hibernacula for the Indiana bat. Purchase of this property would be an excellent opportunity to protect the Lake Monroe watershed, summer roosting habitat for the Indiana bat, and lands available for the bald eagle, and even the osprey.

The Garrison Chapel Valley mitigation site is a property that includes Coon and Grotto caves (Appendix B-3 – Site #12). Both of these caves are Priority II hibernacula for the Indiana bat. The number of Indiana bats has doubled in both caves in the last 2 years. In the Garrison Chapel, there are 4 other Indiana bat hibernacula (Buckner, King Blair, Salamander, and Saltpeter). These are Priority III caves, some of which have been declining due to human influences. Purchase of this property would be an excellent opportunity to gate these two caves and protect their vertebrate and invertebrate inhabitants from human disturbances. Purchasing of Buckner's Cave and/or Leonard Springs Cave to the south would also be beneficial. The mitigation site, including Coon and Grotto caves, is forested. The proposed design concept of this mitigation site is to protect these caves from encroachment by development and to protect this mature timbered parcel of core forest. Caves will be purchased and openings protected to exclude human disturbances. This mitigation site would protect summer, winter, and autumn/spring habitat for the Indiana bat.

The Beanblossom Bottoms mitigation site is near the Beanblossom Bottoms wetland complex (Appendix B-3 – Site #13). Beanblossom Bottoms area includes a complex of high quality hardwood wetlands that harbor many unique plants and animals. Mitigation in this area would provide habitat for the bald eagle, Indiana bat, bobcat, and many species of amphibians and reptiles. The proposed design of this mitigation site would be shallow water, slough-like habitat. Such a habitat would attract ducks, geese, and wading birds. Of special interest would be whooping and sandhill cranes. Bottomland woods of oak and hickory will provided, as appropriate, for isolation and protection by shy species. This mitigation site would increase summer roosting habitat for the Indiana bat and increase bald eagle nesting and feeding habitats.

The White River (Gosport) mitigation site is near the confluence of Beanblossom Creek with the White River between Stinesville and Gosport (Appendix B-3 – Site #14). This property provides an excellent opportunity for creating riparian buffers along the White River and improving habitat for the Indiana bat and bald eagle. The proposed design of this mitigation site would be a bottomland woods with riparian buffers along the White River. Such habitat could be used by the Indiana bat and bald eagle, and to improve the water quality of the White River. Improving water quality could increase the potential for mussels in this area. This mitigation site would provide nesting and feeding perches for the bald eagle and increase summer roosting habitat for the Indiana bat.

The Bradford Woods mitigation site is near Bradford Woods (Appendix B-3 – Site #15). Purchase of this property would be an excellent opportunity for expanding core forest habitat and providing habitat for the Indiana bat and other forest-dependent species. The proposed design of this mitigation site would be to add core forest and habitat for forest interior birds. This mitigation would increase summer roosting habitat for the Indiana bat.

The White River (Blue Bluff) mitigation area is expected to be along the White River north of Martinsville near possibly Blue Bluff Nature Preserve (Appendix B-3 – Site #16). The Blue Bluff Nature Preserve has an abundance of the rare shrub flowering raspberries. The preserve also has a richly varied early spring flora, and a profusion of ferns. There are a few large trees within the Blue Bluff Nature Preserve. Mitigation near this area would provide excellent opportunity for habitat for the Indiana bat and bald eagle. The proposed design concept is to restore wetlands and bottomland woods and provide habitat for aquatic and terrestrial TES species with a special emphasis on habitat for the Indiana bat and bald eagle.

## **II. MITIGATION SITES OUTSIDE THE ACTION AREA**

The Pioneer Mother's mitigation site is in Orange County near Pioneer Mother's Memorial Forest (Appendix B-3 – Site #16). This site is within the Hoosier National Forest purchase boundary and is within a karst area. Purchase of this property would be an excellent opportunity to increase core forest habitat and summer habitat for the Indiana bat. Such a purchase would protect this mature timbered parcel of core forest and old growth woods from encroachment by development. Pioneer Mother's Memorial Forest was first established in 1816. This mitigation site would protect summer roosting habitat for the Indiana bat along with some karst features. In addition, there is considerable archaeological significance in this area.

The Lost River (Orangeville) mitigation site is in Orange County near Orangeville (Appendix B-3 – Site #17). This very large site is within the Hoosier National Forest (HNF) purchase boundary. It is mostly wooded with several caves, ponds, and other karst features. Its significance is to protect one of the best cave and karst systems in the State of Indiana. Purchase of this property would be an excellent opportunity to protect state and federally listed TES species, and core forest habitat. The purchase of this property would protect many species dependent on karst. It has many similarities with Tinchel Pond, which is considered a jewel of the HNF. Both areas have many endemic karst species. This mitigation site would protect summer, fall/spring, and possibly winter habitat for the Indiana bat, and many endemic troglitic species.

## **III. GOALS**

The goal of forest and wetland mitigation is to create wetlands and forests which not only mitigate the environmental impacts caused by the project, but enhance the environment. These mitigation sites should accomplish this goal and emphasize natural forest and wetland communities that use native trees and herbaceous vegetation. It is anticipated that target functions and values for the mitigation sites may be achieved within a 3 to 5 year time frame, including flood storage and wildlife use; however, woody species will require a longer time frame to achieve their functions. Complete habitat replacement may take 20-30 or more years for woody species to mature. Education and research opportunities may be available through the life of the project.

The mitigation sites will replace, with a net gain, flood retention, ecological functions, and wildlife habitat values in the impact forest and wetland sites. Converting farm fields connected to existing forest and wetland complexes to forested, scrub/shrub, emergent, open water wetlands, and upland forests, will provide an opportunity for: (1) a higher "carrying capacity" for wildlife; (2) colonization by TES plant species; (3) potential habitat for State and Federal listed animal species such as the Indiana bat, bald eagle, loggerhead shrike, and possibly others; (4) habitat for gamebirds and passerines; and (5) habitat for many reptiles, amphibians, and mammals. When mitigation sites mature, which may take more than 5 years, environmental benefits will be significant.



#### **A. TYPES, FUNCTIONS AND VALUES OF IMPACTED EXISTING WETLANDS**

Wetlands and forests impacted are within the variable width working alignment for Alternative 3C for the I-69 Evansville to Indianapolis project. Wetland impacts were calculated from National Wetland Inventory maps. The wetland impacts fall within five 8-digit watersheds. Appendix B-1 contains a map showing potential wetland impact sites and the 8-digit watersheds.

#### **B. TYPES, FUNCTIONS AND VALUES OF THE WETLANDS**

Wetland mitigation sites are primarily farm fields, connected with existing wetlands and bottomland woods. The forest mitigation sites are a combination of existing forests and agricultural fields connected to existing upland and bottomland woods. Indiana Department of Transportation will purchase lands at fair market value or purchase lands as easements from “willing sellers” for impacts to wetlands and forests from the construction of I-69. The farm fields purchased for wetland and forest mitigation will be converted, for the most part, to wetland, bottomland, and upland forests, and to a lesser extent scrub/shrub, and emergent wetlands. Upland buffer strips will be located around all wetland mitigation sites to act as “filter traps”. Hydrology for wetland mitigation sites will be defined on a case-by-case basis for each site, but earth moving and maintenance requirements will be minimized to the greatest degree possible. The remaining forest impacts will be mitigated by purchasing existing forests, that are within unique habitat areas, and protecting them.

We anticipate that these sites will be attractive to the Indiana bat, bald eagle, and many state listed TES species. Addition of these mitigation sites to existing wetlands, bottomland, and upland woods will accentuate the diversity of habitats within southwestern Indiana, and provide optional food, cover and nesting sites.

### **IV. MITIGATION SUCCESS CRITERIA**

#### **A. MITIGATION RATIO**

A total of 220 acres of NWI wetlands are identified in this Tier 1 Forest and Wetland Mitigation and Enhancement Plan for replacement by the potential loss of 65 acres of forested wetlands, 5 acres of impacted scrub/shrub wetlands, and 5 acres emergent wetlands. This Tier 1 Forest and Wetland Mitigation and Enhancement Plan has a ratio of 3:1 replacement for the forested and scrub/shrub wetlands, and 2:1 replacement for emergent wetlands. In addition to wetland mitigation, a total of 1,062 acres of potential upland forest impacts were identified, and at a ratio of 3:1 would require 3,186 acres of forest mitigation. A buffer for each wetland mitigation site has also been included within this plan. A total of 55 acres of land is included for such buffers. This is a minimum mitigation for upland and wetlands. Further enhancements will be determined with the appropriate regulatory agencies on a case-by-case basis. Wetland impacts will be mitigated within their same 8-digit watersheds. Table 1 shows the types, impacts, mitigation ratios, and an estimated amount of mitigation acres as located within the Action Area for the I-69 Alternative 3C. This estimate comes from NWI maps. Table 2 shows additional mitigation sites located outside the Action Area for upland forest habitat.

#### **B. PERFORMANCE STANDARDS FOR WETLAND MITIGATION**

The Memorandum of Agreement Between the Department of the Army and the Environmental Protection Agency pertaining to The Determination of Mitigation Under The Clean Water Act Section 404 Guidelines updated on December 31, 2002 states that monitoring is an important aspect of mitigation, especially in areas of scientific uncertainty. Monitoring should be directed toward determining whether permit conditions are complied with and whether the purpose intended to be served by the conditions are actually achieved. Any time it is determined that a permittee is in non-compliance with the mitigation requirements of the permit, the Corps will take action in accordance with 33 CFR Part 326. Monitoring should not be required for purposes other than these, although information for other uses may accrue from the monitoring requirements. For projects to be permitted involving mitigation with higher levels of scientific uncertainty, such as some forms of compensatory mitigation, long term monitoring, reporting, and potential remedial action should be required. Performance standards for wetland mitigation and monitoring have been proposed by the Chicago District of the U.S. Army Corps of Engineers in an informational notice "Guidelines for Developing Mitigation Proposals", dated February 1996; the Louisville District of the U.S. Army Corps of Engineers in an informational notice

"Wetland Compensatory Mitigation and Monitoring Plan Guidelines for Kentucky"; and the Detroit District of the U.S. Army Corps of Engineers in an informational notice "Guidance to Applicants for Mitigation", February 1996. We have adopted some of these criteria, summarized below, as performance standards.

<b>Table 1. Habitat Types, impact, mitigation ratios, and mitigation offered <u>within</u> the Action Area for the I-69 Alternative 3C Variable Width Working Alignment, as identified from NWI maps.</b>				
<b>Habitat Type</b>	<b>Impact (acres)</b>	<b>Mitigation Ratio</b>	<b>Minimum Mitigation Offered (acres)</b>	<b>Mitigation (acres)</b>
Forested Wetlands	65	3:1	195	214
Scrub / Shrub Wetlands	5	3:1	15	20
Emergent Wetlands	5	2:1	10	10
Wetland Buffer/Prairies	----	----	55	72
Upland/Bottomland Forests	1,062	3:1	3,186	3,773
<b>Total</b>	<b>1,137</b>	<b>-----</b>	<b>3,461</b>	<b>4,050</b>

<b>Table 2. Additional mitigation sites located <u>outside</u> the Action Area for upland forest and karst habitat.</b>	
<b>Habitat Type</b>	<b>Conservation Acres Available</b>
Karst Property in Lost River Area	1,100
Old Growth Forest Habitat Near Pioneer Mothers	80
<b>Totals</b>	<b>1,180</b>

1. **Cover Crop:** A temporary cover crop will be planted in non-flooded areas upon completion of grading. If desired long-term vegetation is not planted at that time, it will be planted in the first available growing season appropriate to each species.
2. **Percent Cover:** The percent cover required in the first monitoring season in each wetland (except emergent) is 15%. After 3 years, 45% cover must be attained. After 5 years, 75% cover is expected.
3. **Occurrence:** At least 10% of the individuals of each species that were planted in each community zone shall be present in the first monitoring year. After 3 years, this percentage shall be 30%. After 5 years, 50% of the species shall be represented.
4. **Richness:** By the end of the first full season after planting, at least 10% of the species represented (measured by percent cover or other relative abundance measure) shall be non-weedy native perennial species. Some of these species may be volunteers. The combined percentage of plant material that is non-weedy and native shall be 30% after 3 years and 50% after 5 years.
5. **Survival:** Scrub/shrub and forested wetland areas shall have a survival of 75% after one full year. At the end of the 5th year, at least 50% survival of seedlings is required.
6. **Wetland Delineation:** At the end of the 5-year monitoring period, INDOT shall complete a wetland delineation of the site. At that time, a minimum of 95% of the site will meet current wetland criteria. The delineation report shall be submitted to the Army Corps of Engineers (USACE) for review and copies provided to the Indiana Department of Natural Resources (IDNR), U.S. Fish and Wildlife Service (USFWS), and the Indiana Department of Environmental Management (IDEM) with a request for final approval. The site will be monitored at least 1 / year for 5 years or less, depending upon approval from the Corps. It is recommended that the site be monitored 3 or more times per year to gather more data.

### **C. CONTINGENCY PLAN FOR MITIGATION**

Should performance standards stated above not be met, Indiana Department of Transportation will submit an analysis of factors contributing to the discrepancy. This analysis will be included in the monitoring reports, and corrective measures will be proposed for approval by the U.S. Army Corps of Engineers, Indiana Department of Natural Resources, U.S. Fish and Wildlife Service, and Indiana Department of Environmental Management. For

instance, if hydrologic conditions necessary for wetland formation are not present, this situation will be corrected by the most practical method to obtain proper wetland hydrology. If other factors result in demise of wetland plants, corrective steps will be taken to remedy the situation. This may include selective herbicide use, sediment removal, erosion control measures, animal depredation deterrents, or others. If necessary, the plant list may be changed for replantings to better match plants to site conditions. Replanting shall be performed to meet above stated performance standards. Any portions of the mitigation sites replanted shall be monitored to assure compliance with performance standards.

## **V. IMPLEMENTATION PLAN**

### **A. RATIONALE FOR EXPECTED SUCCESS OF MITIGATION AREAS**

Reasons for expected success of the wetland and upland forest mitigation sites include the occurrence of unique and high quality habitats in the areas near these mitigation sites. Mitigation sites are to extend outward from such environmentally productive sites.

### **B. RESPONSIBLE PARTIES**

INDOT will purchase mitigation sites or purchase conservation easements from “willing sellers” with a restriction clause on its special use as a wetland or upland forest mitigation site. Properties will have signs indicating "No Spraying or Mowing" and wetland mitigation sites and forest mitigation site that receive planting will be monitored for 5 years. Monitoring may be completed by INDOT or a contracted environmental consultant.

### **C. HABITAT IMPROVEMENT STRUCTURES**

Habitat improvement structures will be constructed within mitigation sites on a case-by-case basis. Examples could be bluebird boxes, wood duck boxes, bat roosting structures, raptor nesting platforms and others.

### **D. CONSTRUCTION SCHEDULE**

Site preparation of wetland and upland forest mitigation sites will occur in a timely manner to allow planting to immediately follow in the spring of the year.

## **VI. MONITORING**

Construction and post-construction monitoring is proposed for all sites that receive planting to ensure that the mitigation sites are constructed and develop as designed.

### **A. CONSTRUCTION MONITORING**

1. Wetland scientists, foresters, and construction engineers will be available to meet with the CONTRACTOR prior to beginning wetland work to review plans and answer questions. The wetland scientists, foresters, and construction engineers will review the sites again when the CONTRACTOR has completed work to ensure design goals are met. Additional site visits will be made as necessary.
2. Planting of wetlands and forests should be performed by someone experienced in installing forest and wetland plants to ensure they are installed within suitable microhabitats. Species planted will require bill of lading forms indicating species, source, and number planted on that day. Sites will again be inspected by qualified wetland scientists, foresters, and construction engineers following planting to ensure or guarantee that installation was completed according to planting schedule and plans.
3. Within 6 weeks of completing plant installation, INDOT will submit a letter to the U.S. Army Corps of Engineers, Indiana Dept. of Natural Resources, Indiana Dept. of Environmental Management, and U.S. Fish and Wildlife Service indicating that mitigation sites are complete. This letter will describe the methodology and as-built conditions including as-built contours. Deviations from the submitted plan will be detailed and justified in this letter.

## **B. POST-CONSTRUCTION MONITORING**

Forest and wetland mitigation sites that receive plantings will be monitored by the Indiana Department of Transportation for a minimum of 1 time per year for five (5) consecutive years or less, depending upon approval from Army Corp of Engineers; following completion of planting. INDOT will complete a short report detailing results of annual inspections. This report will be forwarded to the U.S. Army Corps of Engineers, Indiana Dept. of Natural Resources, Indiana Dept. of Environmental Management, and U.S. Fish and Wildlife Service on a yearly basis by December 31 of each year. The report will include:

1. Site Locations (Description and identification of topographic map)
2. Initial Date of Planting (If required)
3. Surface and groundwater depths in wetland mitigation sites.
4. A minimum of three (3) photographs taken from prescribed locations on each site (if sites are larger than 5 acres, the Division of Fish and Wildlife may require additional photographs of the sites).
5. Estimates of percent plant cover in mitigation sites. Each site will have at least one 6.1 meter (20-foot) diameter permanent sampling station. Each sampling station will be selected the first year, one in each planting community and reforestation area, and marked with stakes. A list of dominant species found will be compiled for each of 5 years after the first growing season.
6. Observations of wildlife use during each site visit will be documented.
7. A discussion of the development of the forests and wetlands, and identification of problems. If problems are encountered, recommendations to correct the problem(s) will be made.

## **VII. SUMMARY**

The “Tier 1 Forest and Wetland Mitigation and Enhancement Plan” proposes to create a minimum of 195 acres of forested wetlands (3 to 1 replacement ratio), 15 acres of scrub/shrub wetlands (3 to 1 replacement ratio), 10 acres of emergent wetlands (2 to 1 replacement ratio), 3,186 acres of upland forest (3 to 1 replacement ratio) and 55 acres of buffer (usually in prairie vegetation) for wetland impact sites. This Mitigation and Enhancement Plan is offering more than minimum amount of mitigation. It offers 4,050 acres of total mitigation in the Action Area and 1,180 acres outside the Action Area. If all 17 mitigation sites were implemented, the total amount of mitigation would be 5,230 acres which is 1,769 acres more than needed. These figures are based on Tier 1 data. During Tier 2 studies, these numbers will be refined as appropriate.

Impacts of this project on the nation's wetland resources appears large due to the use of NWI data. However, wetland impacts for Alternative 3C are expected to be far less. To offset impacts of the project, compensatory mitigation is offered to replace lost wetlands within the same watershed, and replace or protect upland forest at locations within the Alternative 3C study area. Replacement of wetlands and upland forests at these mitigation sites will provide wildlife functions and human values. Mitigation sites will be restricted from other uses to ensure they remain in a natural condition in perpetuity.

## Wetland Impact Sites and 8-Digit HUC Map





# Impacted Wetlands with in 8 Digit HUC's

0 6 12 Miles

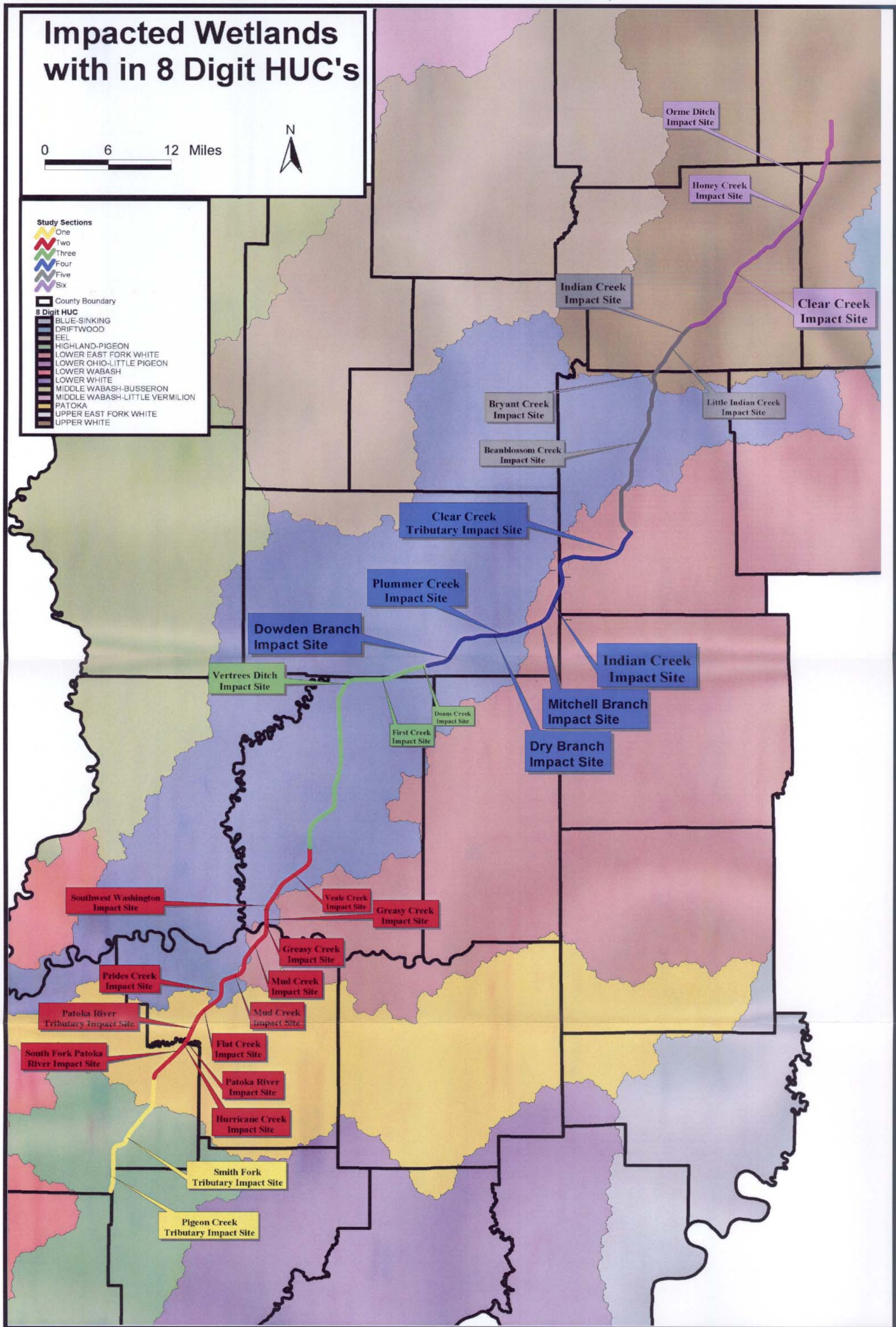


## Study Sections

- One
- Two
- Three
- Four
- Five
- Six

## 8 Digit HUC

- BLUE-SINKING
- DRIFTWOOD
- EEL
- HIGHLAND-PIGEON
- LOWER EAST FORK WHITE
- LOWER OHIO-LITTLE PIGEON
- LOWER WABASH
- LOWER WHITE
- MIDDLE WABASH-BUSSERON
- MIDDLE WABASH-LITTLE VERMILION
- PATOKA
- UPPER EAST FORK WHITE
- UPPER WHITE









## Map of Proposed Mitigation Sites











## Proposed Mitigation Site Forms



# Site # 1

## Highland-Pigeon Watershed – Section 1 Wetland and Forest Mitigation – Pigeon Creek

### WETLAND IMPACT TYPES

#### NWI Data\*

Forested	5.0 acres
Scrub / Shrub	0 acres
Emergent	<u>0 acres</u>
Total	5.0 acres

### UPLAND FOREST IMPACTS

1.0 acre

### MITIGATION

NWI Wetlands Plus 25% Buffer	20 acres
Upland/Bottomland Forest	3 acres
Size of Mitigation Site (Proposed)	23 acres

### DESCRIPTION

This mitigation site is in the Pigeon Creek bottoms between Elberfeld and Mackey (See map on back). This area is an extremely attractive area for many plants and animals, including the swamp rabbit, ferns, copperbelly watersnake, great blue heron rookeries, and a mosaic of various wet to dry habitats. (See photograph on back for a visual representation of mitigation site)

### SPECIES

This mitigation site is targeted for the following:

Federally Listed	Indiana bat		
State Listed	Swamp Rabbit	Sedge Wren	Bewick's Wren
	Copperbelly Watersnake	Northern Harrier	Deciduous Holly
	American Bittern	Red Shouldered Hawk	Bald Cypress
	Least Bittern	Cerulean Warbler	King Rail
Other Species	Southern Cane	Ferns	Great Blue Heron
	Carexes		

### POTENTIAL PARTNERSHIPS

Four Rivers Resource Conservation and Development  
United States Fish and Wildlife Service

Indiana Department of Natural Resources  
Educational Centers / Research

### CONCEPTUAL PLAN

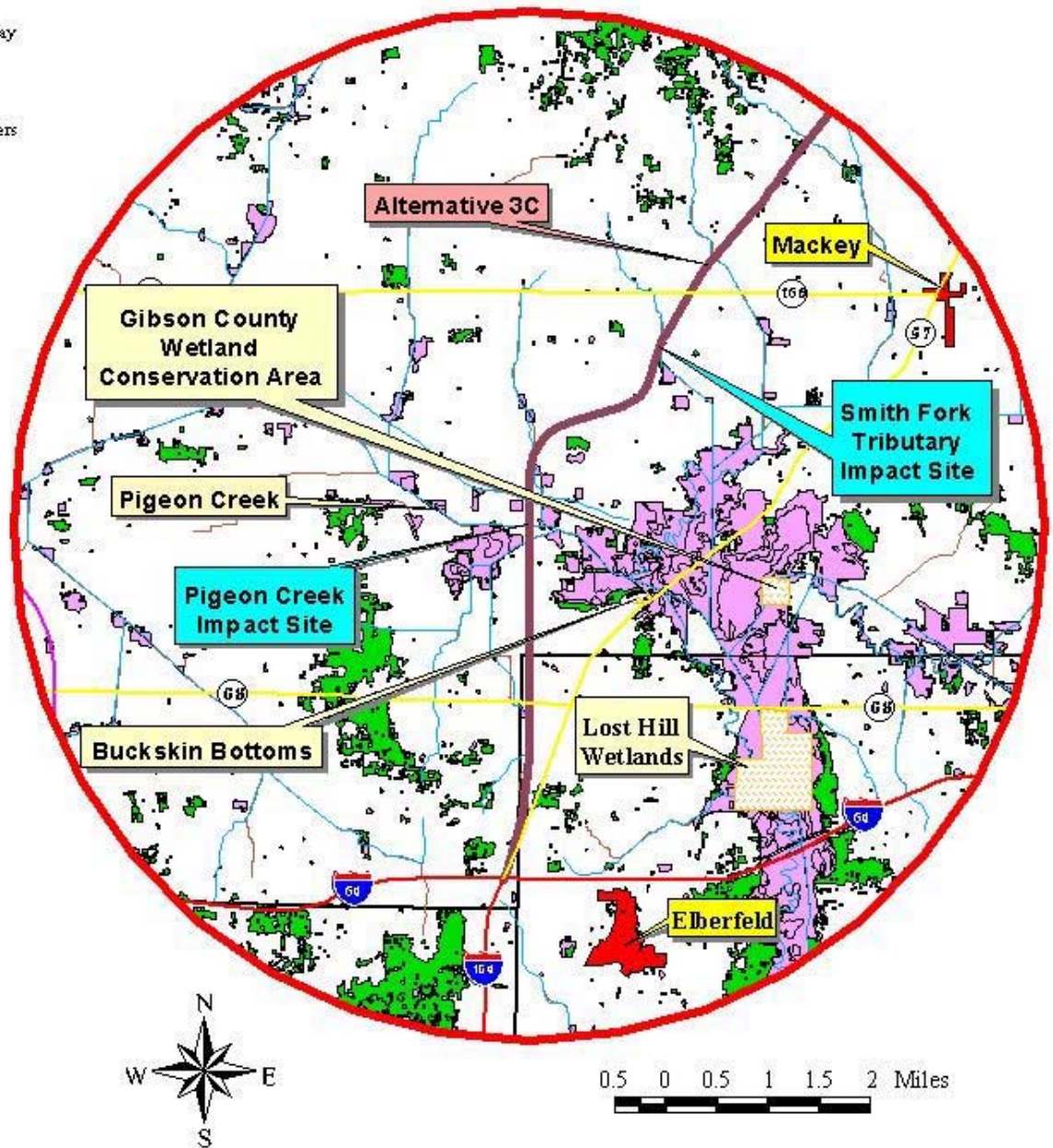
Design a wetland woods of bald cypress and swamp cottonwood with wet holes of broad-leaved emergents as bordered by buttonbush, and at a slightly higher elevation, southern cane and then a bottomland woods of oak and hickory. Such plantings are to extend existing wetlands and woods for greater core forest and TES habitat.

### MITIGATION TYPE AND THEME

Mitigation in this area would benefit both federal (e.g., Indiana Bat) and a number of state listed TES species.

\* NWI Impact Areas – Pigeon Creek Tributary and Smith Fork Tributary

-  Managed Lands
-  Interstate Highway
-  US Highway
-  State Highway
-  Streams and Rivers
-  Wetlands
-  Forested Lands





# Site # 2

## Patoka River Watershed – Section 2 Wetland and Forest Mitigation – Patoka River Bottoms

WETLAND IMPACT TYPES		NWI Data*
Forested		14.0 acres
Scrub / Shrub		2.3 acres
Emergent		<u>0.5 acres</u>
	Total	16.8 acres

**UPLAND FOREST IMPACTS** 36.0 acres

### MITIGATION

NWI Wetlands Plus 25% Buffer	65 acres
Upland/Bottomland Forests**	235 acres
Size of Mitigation Site (Proposed)	300 acres

**DESCRIPTION** This mitigation site is within the Patoka River Bottoms (See map on back). These bottoms showed the highest biodiversity crossed by Alternate 3C and the only federally listed species (i.e., Indiana bat). Historically, much of the Patoka River bottoms have been altered by agriculture and mining; however, many opportunities exist today for mitigation (See photo on back for proposed visual representation of mitigation site).

**SPECIES** This mitigation site is targeted for the following:

Federally Listed	Indiana bat	Bald Eagle	
State Listed	Swamp Rabbit	River Otter	Barn Owl
	Paddlefish	Short-eared Owl	Red-Shouldered Hawk
	Copperbelly Watersnake	Northern Harrier	Loggerhead Shrike
	Night Herons (both)	Whooping Crane	Sandhill Crane
Other Species	Southern Cane	Deciduous Holly	Prairie Species

### POTENTIAL PARTNERSHIPS

United States Fish and Wildlife Service	Indiana Department of Natural Resources
Four River Resource and Conservation District	Educational Centers / Research

### CONCEPTUAL PLAN

Design for a shallow water, slough-like habitat that would be open to view from a nearby visitor's center. Such a habitat would attract ducks and geese along with various-sized wading birds. Of special interest would be whooping and sandhill cranes. A cane marsh would be located at a slightly higher elevation with prairie vegetation at even higher elevations. Bottomland woods of oak and hickory will be provided, as appropriate, for a visual barrier where needed. An interchange for the refuge is proposed at CR 125 S.

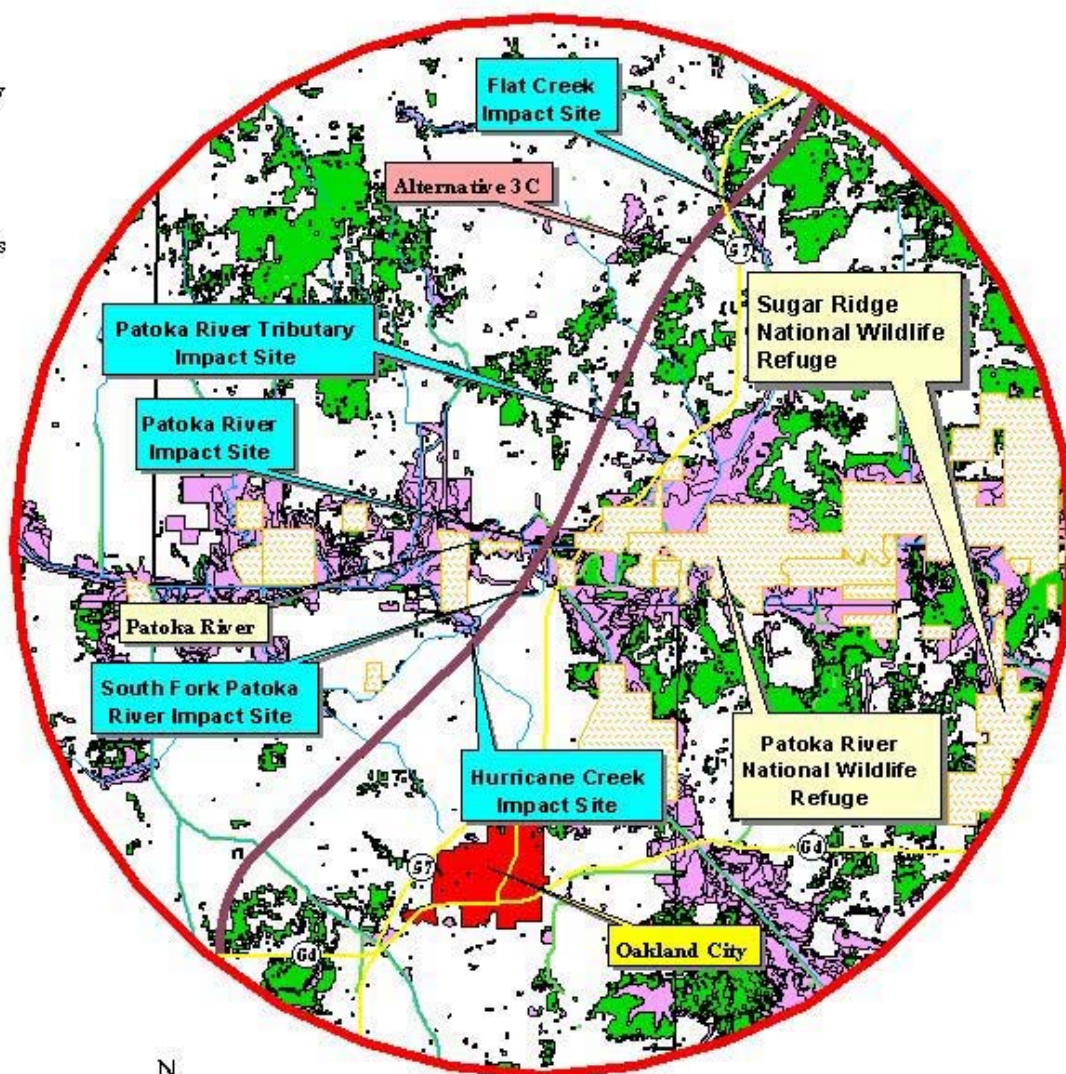
### MITIGATION TYPE AND THEME

INDOT and FHWA are on record as partners with the USFWS in developing a stewardship role that will develop habitat along the Patoka River for the Indiana bat, bald eagle, and state listed species as appropriate. Restoration/Replacement, Conservation/Preservation, and Educational would be the mitigation themes for this site.

\* NWI Impact Areas – South Fork Patoka River, Hurricane Creek, Patoka River, Patoka River Tributary, and Flat Creek

\*\* Additional Upland/Bottomland Forest is being offered at this site over what is required.

-  Managed Lands
-  Interstate Highway
-  US Highway
-  State Highway
-  Streams and Rivers
-  Wetlands
-  Forested Lands



# Site # 3

## Lower East Fork of the White River Watershed – Section 2 Wetland and Forest Mitigation – East Fork Site

WETLAND IMPACT TYPES		NWI Data*
Forested		6.0 acres
Scrub / Shrub		0.2 acres
Emergent		<u>0 acres</u>
	Total	6.2 acres

UPLAND FOREST IMPACTS 90 acres

### MITIGATION

NWI Wetlands Plus 25% Buffer	25 acres
Upland/Bottomland Forests**	475 acres
Size of Mitigation Site (Proposed)	500 acres

**DESCRIPTION** This mitigation site is expected to be near the crossing of the East Fork of the White River (See map on back). The mitigation site would be planted as a flatwoods of oak and hickory with numerous openings planted in prairies and cedars with hawthorns, and small pockets of water with wetland plants. This site would be connected to the banks of the East Fork and provides an excellent opportunity for developing habitat for the Indiana bat, bald eagle perches for nesting and feeding, and water quality improvements. (See photograph on back for proposed visual representation of mitigation site).

**SPECIES** This mitigation site is targeted for the following:

Federally Listed	Indiana bat	Bald Eagle	
State Listed	Evening Bat	American Badger	Barn Owl
	Loggerhead Shrike	Ornate Box Turtle	East Coast Plants
Other Species	Prairie Plants	Cedars	Flatwoods

### POTENTIAL PARTNERSHIPS

Four Rivers Resource Conservation and Development	Indiana Department of Natural Resources
United States Fish and Wildlife Service	Educational Centers / Research

### CONCEPTUAL PLAN

Design an open upland to bottomland woods with many clearings planted with prairie grasses and plants of sandy soils. The edge of these woods and open clearings should be planted with cedars and hawthorns for use by loggerhead shrike. Near the East Fork, raptor nesting platforms should be erected for use by various birds of prey. Dead snags should be protected for use by the Indiana bat, evening bat, and other species.

### MITIGATION TYPE AND THEME

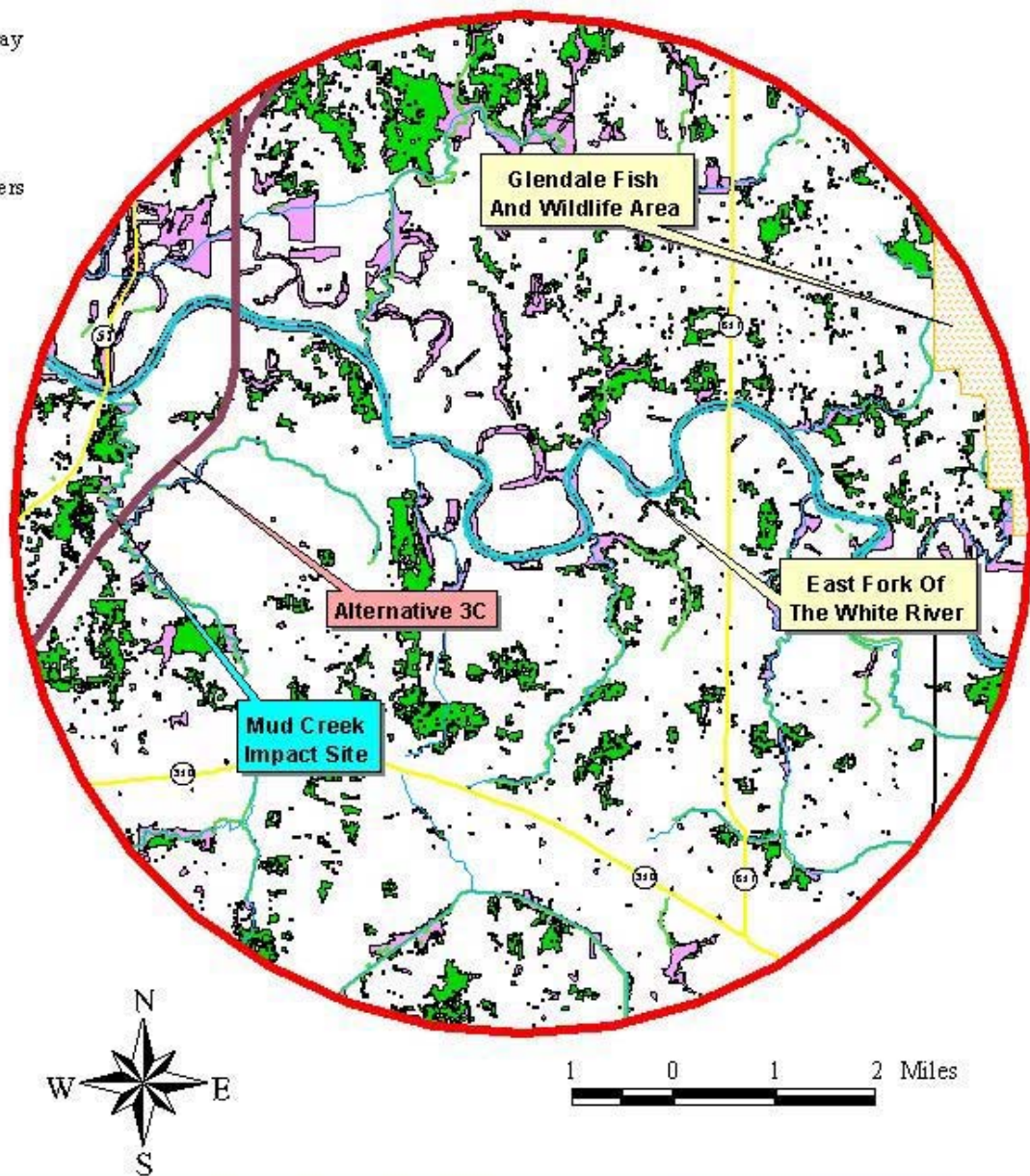
The East Fork Mitigation Site is offered as a patchy forested site with an emphasis placed upon developing habitat for the Indiana bat, bald eagle, loggerhead shrike and other species with an affinity for sandy soils. The soils in this area are very sandy and thus, offer a protected oasis for many plants and animals that are restricted to such dunes. Restoration/Replacement and Education would be the mitigation themes for this site.

\* Wetland Impact Areas – Mud Creek and Greasy Creek

\*\* Additional Upland/Bottomland Forest is being offered at this site over what is required.



-  Managed Lands
-  Interstate Highway
-  US Highway
-  State Highway
-  Streams and Rivers
-  Wetlands
-  Forested Lands



# Site #4

## Lower White River Watershed – Section 3 Forest and Prairie Mitigation– Plainville Sand Dune Region

### WETLAND IMPACT TYPES

#### NWI Data

Forested	0.0 acres
Scrub / Shrub	0.0 acres
Emergent	<u>0.0 acres</u>
Total	0.0 acres

### UPLAND FOREST IMPACTS

30 acres

### MITIGATION

Prairies*	10 acres
Upland/Bottomland Forests	90 acres
Size of Mitigation Site (Proposed)	100 acres

### DESCRIPTION

This mitigation site maybe near Thousand Acre Woods, Badger Badlands, Sand Woods, or Capeheart Sandflats north of Washington (See map on back). These areas are associated with the Plainville Sand Dune Region, a small but unique area of wind blown sand dunes east of the Wabash and White Rivers. The barrens natural community type of this region, now virtually gone from the landscape, was predominant on the ridges and well drained sites, and swamp, marsh, and wet prairie occupied the swales. Many opportunities exist today for mitigation in these areas (See photo on back for proposed visual representation of mitigation site).

### SPECIES

This mitigation site is targeted for the following:

Federally Listed	Indiana bat		
State Listed	American Badger	Barn Owl	Loggerhead Shrike
	Red-Shouldered Hawk	Short-eared Owl	Cerulean Warbler
Other Species	Forest Interior Birds	Plants of Sandy Soils	

### POTENTIAL PARTNERSHIPS

The Nature Conservancy	Indiana Department of Natural Resources
United States Fish and Wildlife Service	Educational Centers / Research

### CONCEPTUAL PLAN

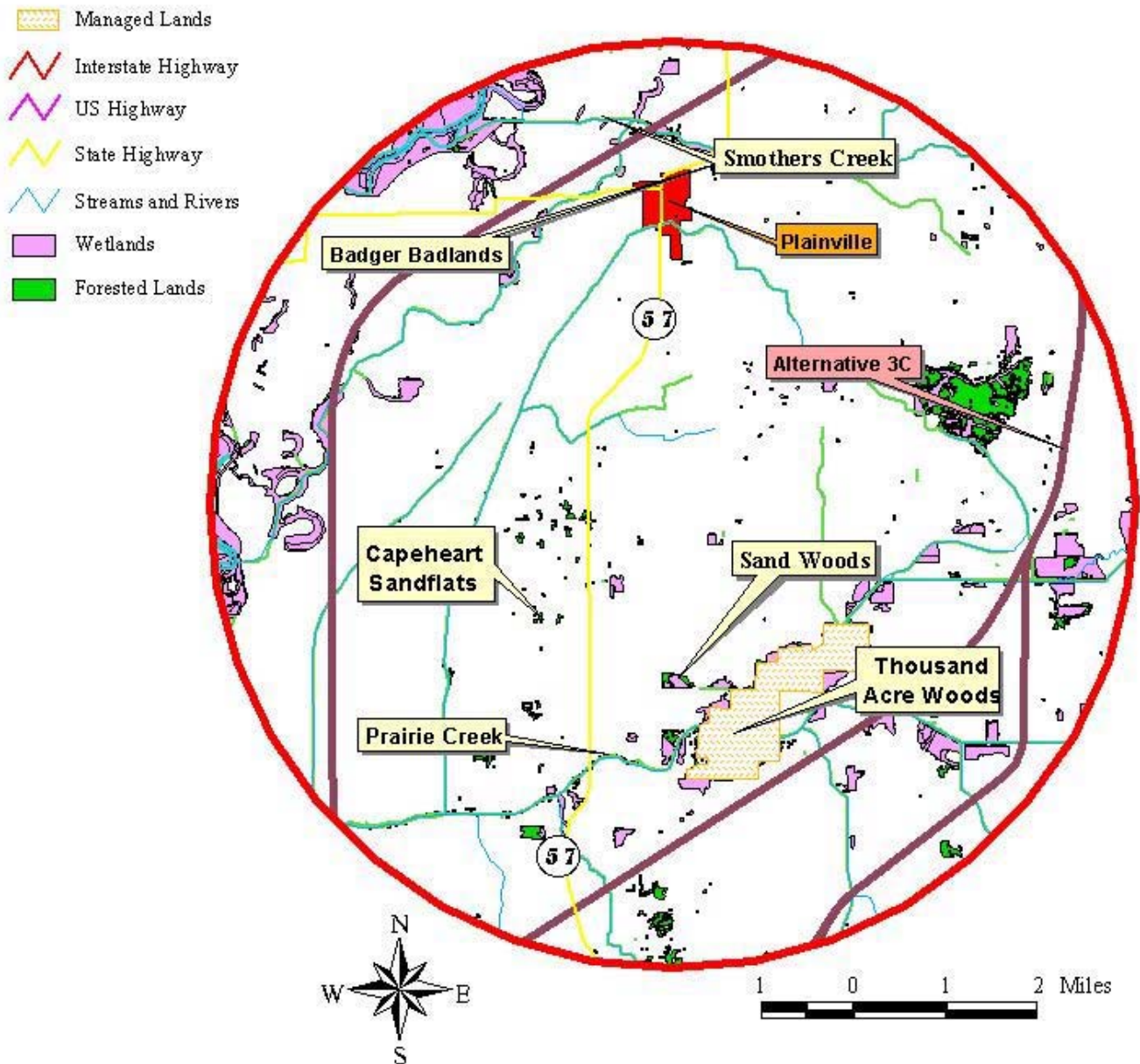
To design for a mosaic of prairies and bottomland woods habitat that would increase core forest habitat and habitat for the Indiana bat and loggerhead shrike near Prairie Creek or Smothers Creek. Such ecosystems would attract numerous species. Of special interest would be yellow-billed cuckoo, Kentucky warbler, crested flycatcher, and the yellow-breasted chat. Bottomland woods will be planted with oak and hickory, while prairies will have bluestem interspersed with red cedars and hawthorns.

### MITIGATION TYPE AND THEME

This mitigation site offers a dense forested area interspersed with prairie with an emphasis placed upon developing habitat for the Indiana bat and state listed species, some of which are prairie species. Restoration/Replacement and Education would be the mitigation themes for this site.

\* Additional 10 acres at this site will be planted in prairie species.





# Site # 5

## Lower White River Watershed – Section 3 Wetland and Forest Mitigation – White River (Elnora)

### WETLAND IMPACT TYPES

#### NWI Data\*

Forested	2.5 acres
Scrub / Shrub	0.1 acres
Emergent	<u>0 acres</u>
Total	2.6 acres

### UPLAND FOREST IMPACTS

140 acres

### MITIGATION

NWI Wetlands Plus 25% Buffer	10 acres
Upland/Bottomland Forests**	430 acres
Size of Mitigation Site (Proposed)	440 acres

### DESCRIPTION

This mitigation site is expected to be along the White River near Elnora (See map on back). This environmentally sensitive area is unique because of its backwater sloughs, oxbow wetlands, and floodplain forest remnants. Oxbows such as the ones located in this area are important for the unique plants and animals that utilize them. They also offer an ecosystem that is very much connected with the White River. Mussels, fish, amphibians, reptiles, birds, and mammals depend upon these areas for survival. Many opportunities exist today for mitigation in this area (See photo on back for proposed visual representation of mitigation site).

### SPECIES

This mitigation site is targeted for the following:

Federally Listed	Indiana bat	Bald Eagle	
State Listed	Evening Bat	American Badger	Barn Owl
	Loggerhead Shrike	Ornate Box Turtle	Alligator Snapping Turtle
Other Species	Prairie Plants	Cedars	Flatwoods

### POTENTIAL PARTNERSHIPS

Indiana Department of Natural Resources  
Educational Centers / Research

United States Fish and Wildlife Service

### CONCEPTUAL PLAN

The concept is to restore wetlands and bottomland woods and provide habitat for both aquatic and terrestrial TES species. Similarly, some of the oxbows that dry up in the mitigation site will be dug and connected to the West Fork of the White River, which will maintain aquatic habitat for fishes, turtles, and mussels throughout the year. Other oxbows will remain disconnected to benefit amphibians, reptiles, and birds which fare better in oxbows that do dry up at some point in the year.

### MITIGATION TYPE AND THEME

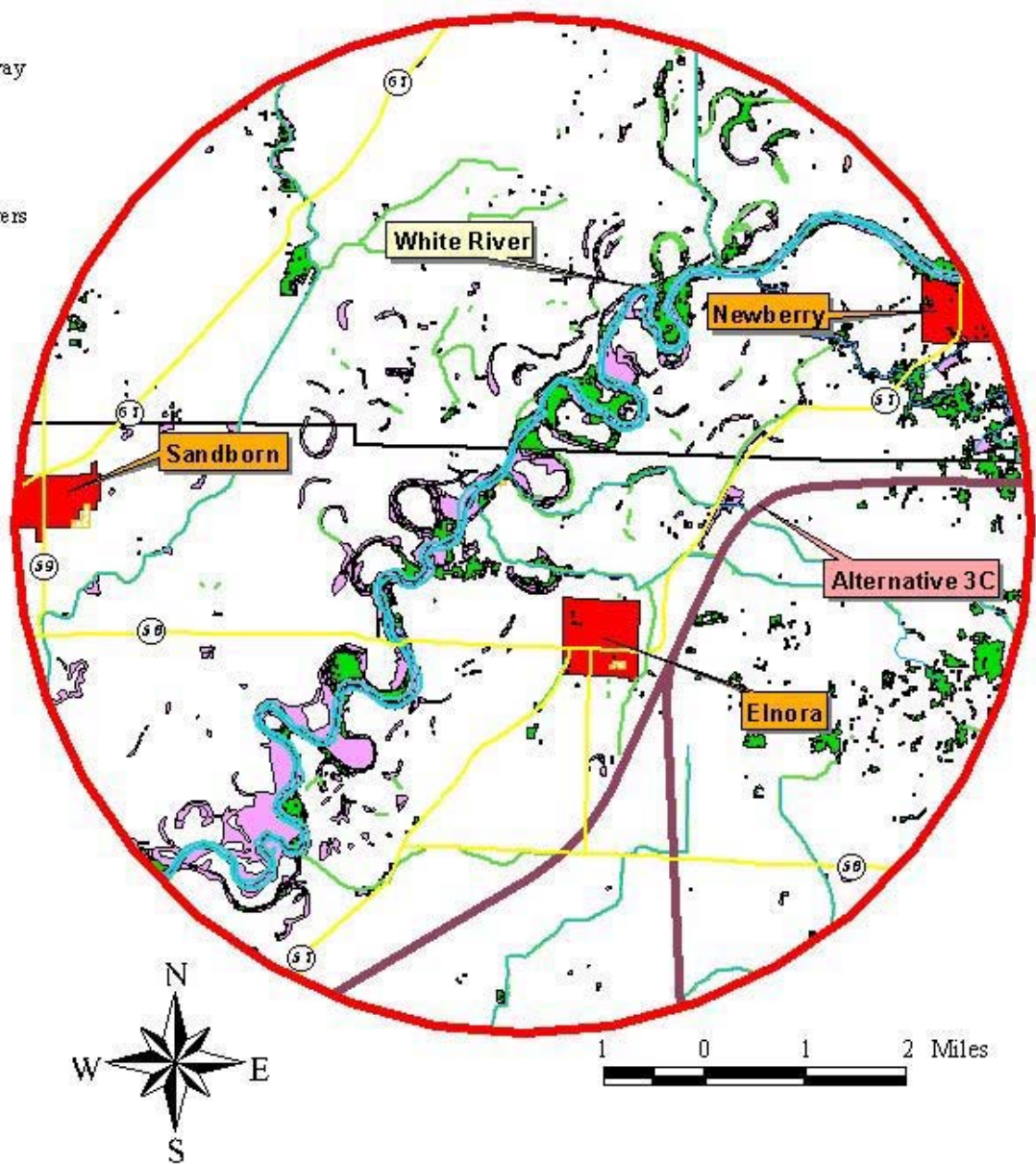
The mitigation site will restore and protect a unique yet dwindling habitat that is a bottomland oxbow ecosystem. Restoration/Replacement, Conservation/Preservation, and Education would be the mitigation themes for this site.

\* NWI Impact Areas – Prides Creek, Mud Creek, Greasy Creek, White River Tributary

\*\* Additional Upland/Bottomland Forest is being offered at this site over what is required.



-  Managed Lands
-  Interstate Highway
-  US Highway
-  State Highway
-  Streams and Rivers
-  Wetlands
-  Forested Lands





# Site # 6

## Lower White River Watershed – Section 3

### Wetland and Forest Mitigation – First Creek

WETLAND IMPACT TYPES		NWI Data*
Forested		5.0 acres
Scrub / Shrub		0.0 acres
Emergent		<u>1.9 acres</u>
	Total	6.9 acres

**UPLAND FOREST IMPACTS** 40 acres

#### MITIGATION

NWI Wetlands Plus 25% Buffer	25 acres
Upland/Bottomland Forests	120 acres
Size of Mitigation Site (Proposed)	145 acres

**DESCRIPTION** This mitigation site is expected to be along First Creek near Newberry (See map on back). This sandy lowland area showed a high potential for summer roosting habitat for the Indiana bat. The area is a mixed of bottomland hardwood forest with interspersed grazing as surround by agriculture. Opportunities for mitigation in this area are excellent (See photo on back for proposed visual representation of mitigation site).

**SPECIES** This mitigation site is targeted for the following:

Federally Listed	Indiana bat		
State Listed	Evening Bat	American Badger	Bobcat
	Loggerhead Shrike	Ornate Box Turtle	Cerulean Warbler
	Worm-Eating Warbler	Red-Shouldered Hawk	Barn Owl
Other Species	Prairie Plants	Cedars	Flatwoods

#### POTENTIAL PARTNERSHIPS

Indiana Department of Natural Resources	United States Fish and Wildlife Service
Four River Resource and Development District	Educational Centers / Research

#### CONCEPTUAL PLAN

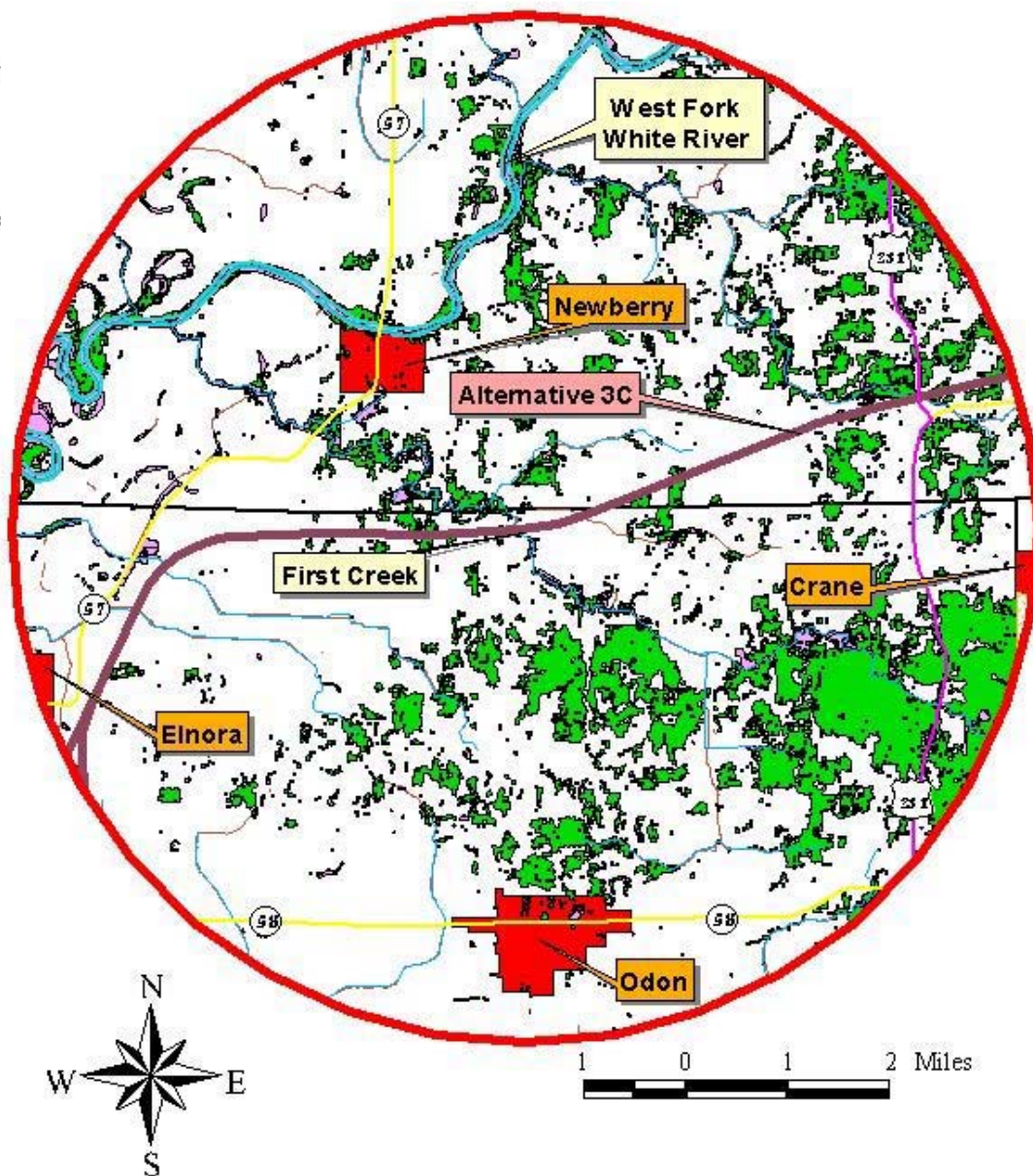
The concept is to restore bottomland woods and forested wetlands so as to provide habitat for the Indiana bat and other TES species. Field studies in this area showed a high potential.

#### MITIGATION TYPE AND THEME

The mitigation type is bottomland woods and forested wetland restoration enhancement, and core forest development. Restoration/Replacement and Education would be the mitigation themes for this site.

\*NWI Impact Areas – Veale Creek, Vertrees Ditch, First Creek, and Doans Creek

-  Managed Lands
-  Interstate Highway
-  US Highway
-  State Highway
-  Streams and Rivers
-  Wetlands
-  Forested Lands



# Site # 7

## Lower East Fork of the White River Watershed – Section 4 American Bottoms

### WETLAND IMPACT TYPES

#### NWI Data

Forested	5.0 acres
Scrub / Shrub	0.0 acres
Emergent	<u>0.0 acres</u>
Total	5.0 acres

### UPLAND FOREST IMPACTS

90 acres

### MITIGATION

NWI Wetlands Plus 25% Buffer	20 acres
Upland/Bottomland Forest *	430 acres
Size of Mitigation	450 acres

### DESCRIPTION

This mitigation site is in Greene County in the area known as the American Bottoms (See map on back). This area has very unique geological features. Although it is not well known. The American Bottoms incorporates approximately 5,200 acres. The purchasing of this property would be an excellent opportunity for increasing summer and winter habitat for the Indiana bat (See photograph on back for proposed visual representation of mitigation site).

### SPECIES

This mitigation site is targeted for the following:

Federally Listed	Indiana bat		
State Listed	Bobcat	Southeastern Bat	Butternut
	Cerulean Warbler	Worm-Eating Warbler	Black & White Warbler
	Hooded Warbler	Sharp-Shinned Hawk	
Other Species	Forest Dependent Birds	Wild Turkey	Deer

### POTENTIAL PARTNERSHIPS

Hoosier National Forest Service	Indiana Department of Natural Resources
United States Fish and Wildlife Service	The Nature Conservancy
Indiana Karst Conservancy	

### CONCEPTUAL PLAN

The concept of this proposed mitigation site is to protect this area from encroachment by development and the protection of its unique karsts features. The purchasing of this property would protect many species dependent upon karst.

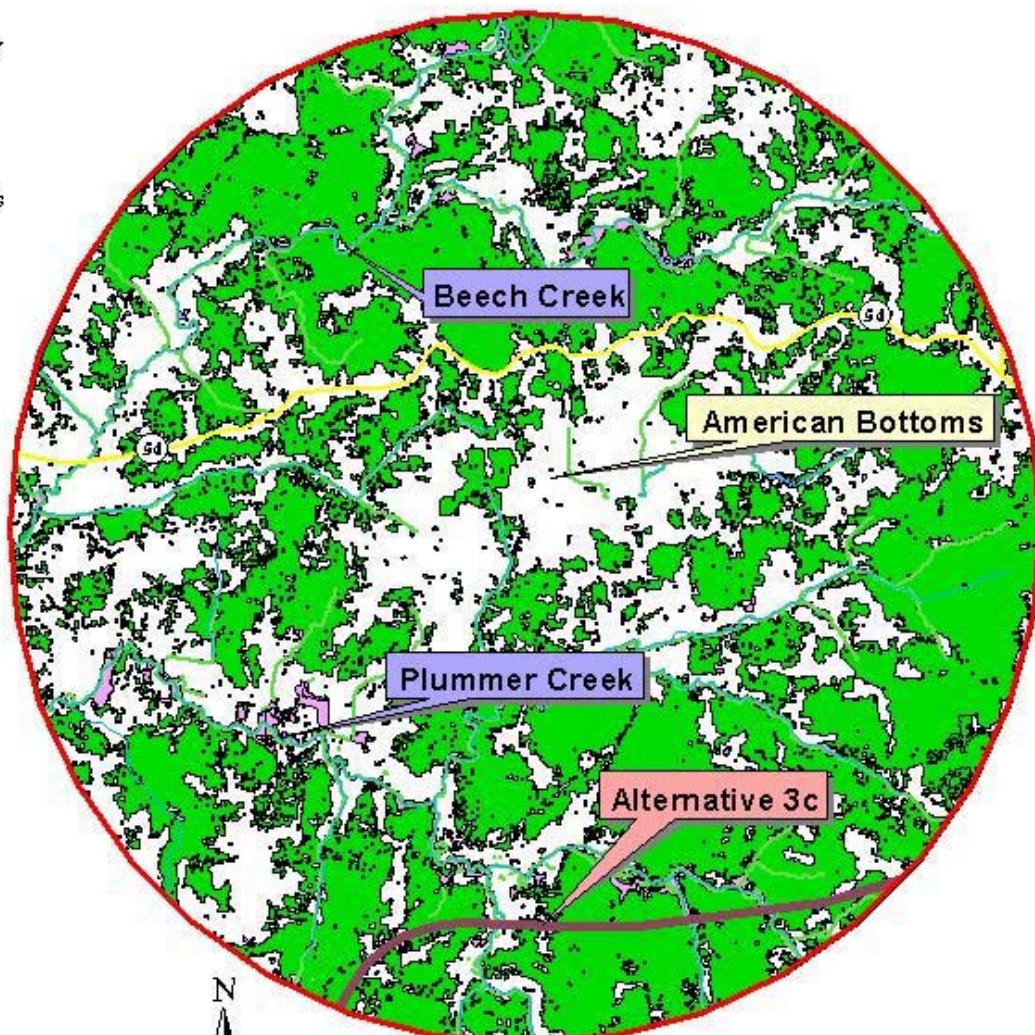
### MITIGATION TYPE THEME

Protection of this area is a conservation measure for the population of Indiana bats in the State of Indiana. It is a Good Faith Effort by INDOT and FHWA in increasing Indiana bat populations in Indiana. Conservation/Preservation and Education would be the mitigation themes for this site.

\* Additional Upland/Bottomland Forest is being offered at this site over what is required.



-  Managed Lands
-  Interstate Highway
-  US Highway
-  State Highway
-  Streams and Rivers
-  Wetlands
-  Forested Lands



# Site # 8

## Lower East Fork of the White River Watershed – Section 4 Wetland and Forest Mitigation – Sexton Spring Cave

### WETLAND IMPACT TYPES

#### NWI Data\*

Forested	8.0 acres
Scrub / Shrub	0.0 acres
Emergent	<u>0.0 acres</u>
Total	8.0 acres

### UPLAND FOREST IMPACTS

140 acres

### MITIGATION

NWI Wetlands Plus 25% Buffer	30 acres
Upland/Bottomland Forests	420 acres
Size of Mitigation Site (Proposed)	450 acres

### DESCRIPTION

This mitigation site is Sexton Spring Cave (if possible), and / or the surrounding area (See map on back). This would be an excellent opportunity for gating this cave and protecting the cave and its vertebrate and invertebrate inhabitants from human disturbances. (See photograph on back for proposed visual representation of mitigation site). Forest mitigation will come in the term of protecting existing woods and the planting of additional upland and bottomland woods.

### SPECIES

This mitigation site is targeted for the following:

Federally Listed	Indiana bat		
State Listed	Bobcat	Southeastern Bat	Troglobitic Crayfish
	Butternut	Cerulean Warbler	Worm-Eating Warbler
	Black & White Warbler	Hooded Warbler	
Other Species	Cave Springtails	Cave Beetles	Cave Pseudoscorpion
	Cave Salamander	Forest Dependent Birds	Wild Turkey

### POTENTIAL PARTNERSHIPS

Indiana Karst Conservancy  
United States Fish and Wildlife Service

Indiana Department of Natural Resources  
The Nature Conservancy

### CONCEPTUAL PLAN

To design an open, upland woods with many clearings. Some of the clearings will be wetlands, while others will be planted as wet to dry prairies. Properties purchased are expected to have some 50% moderate to older sized timber. The concept is to provide habitat that will provide a year-long source of food for the Indiana bats and core forest dependent species. Similarly, the cave will be purchased (if possible), and the opening will be gated so as to exclude human disturbances.

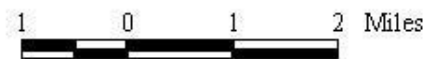
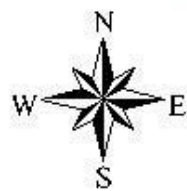
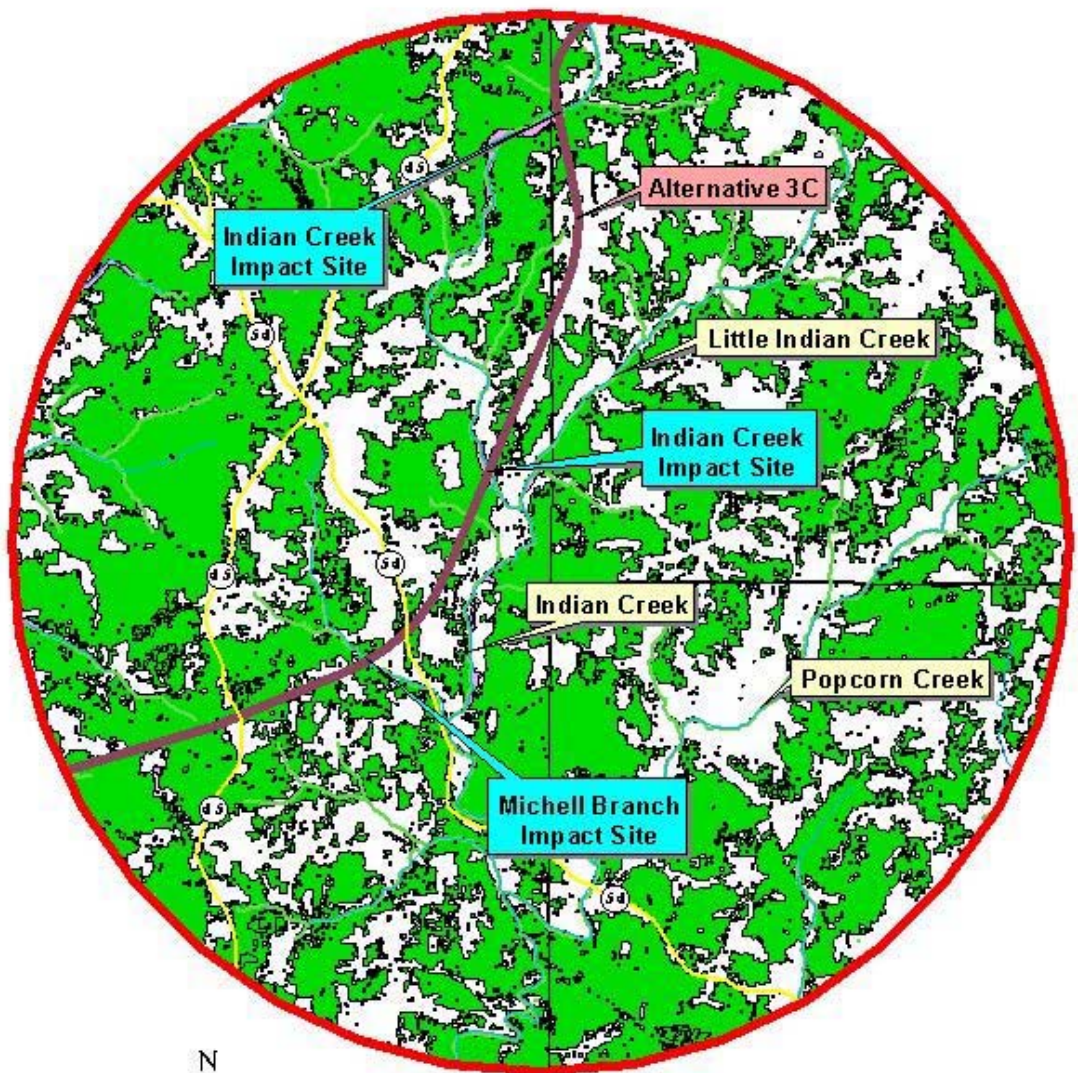
### MITIGATION TYPE AND THEME

Sexton Spring Mitigation Site will offer a patchy, mature forested site with an emphasis on protecting a Priority III Indiana bat hibernacula, increasing the number of Indiana bats in the cave (six surveys since 1993 ranging from 67 to 117 Indiana bats), and providing more core forest. Restoration/Replacement and Conservation/Preservation would be the mitigation themes for this site.

\* Wetland Impact Areas – Mitchell Branch, Indian Creek, and Clear Creek Tributary



-  Managed Lands
-  Interstate Highway
-  US Highway
-  State Highway
-  Streams and Rivers
-  Wetlands
-  Forested Lands



# Site # 9

## Lower White River Watershed – Section 4

### Indiana Bat Conservation – Ray’s Cave

#### WETLAND IMPACT TYPES

#### NWI Data

Forested	0 acres
Scrub / Shrub	0 acres
Emergent	0 acres
Total	0 acres

#### UPLAND FOREST IMPACTS

80 acres

#### MITIGATION

Upland/Bottomland Forests*	250 acres
Size of Mitigation Site (Proposed)	250 acres

#### DESCRIPTION

This mitigation site is a 250-acre property which includes Ray’s Cave (See map on back). This cave is a Priority 1 hibernaculum for the Indiana bat. The purchasing of this property would be an excellent opportunity for gating this cave and protecting its vertebrate and invertebrate inhabitants from human disturbances. (See photograph on back for proposed visual representation of mitigation site). It is expected that this property would be placed within the Forest Legacy Program. A recent survey of this cave showed some 50,000 Indiana bats.

#### SPECIES

This mitigation site is targeted for the following:

Federally Listed	Indiana bat		
State Listed	Bobcat	Southeastern Bat	Troglobitic Crayfish
	Butternut	Cerulean Warbler	Worm-Eating Warbler
	Black & White Warbler	Hooded Warbler	Sharp-Shinned Hawk
Other Species	Cave Springtails	Cave Beetles	Cave Pseudoscorpion
	Cave Salamander	Forest Dependent Birds	Wild Turkey

#### POTENTIAL PARTNERSHIPS

Indiana Karst Conservancy  
United States Fish and Wildlife Service

Indiana Department of Natural Resources  
The Nature Conservancy

#### CONCEPTUAL PLAN

This 250-acre property with Ray’s Cave is forested. The concept is to protect this cave from encroachment by development and the protection of this mature timbered parcel for core forest. This cave will be purchased and the opening(s) gated so as to exclude human disturbances.

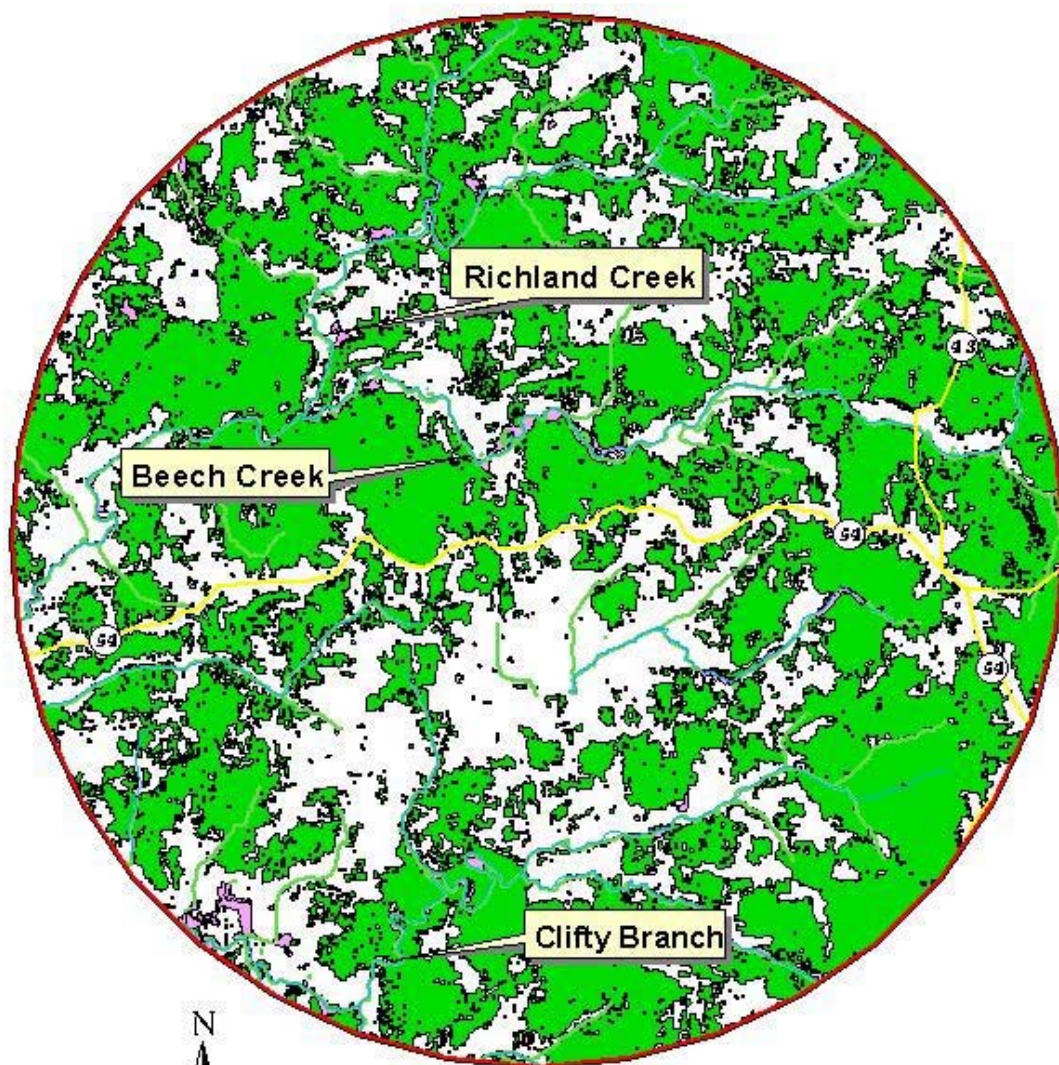
#### MITIGATION TYPE AND THEME

Protection of this cave is a conservation measure for the population of Indiana bats in the State of Indiana. It is a Good Faith Effort by INDOT and FHWA in increasing Indiana bat populations in Indiana. Restoration/Replacement and Conservation/Preservation would be the mitigation themes for this site.

\* Additional Upland/Bottomland Forest is being offered at this site over what is required.



- Managed Lands
- Interstate Highway
- US Highway
- State Highway
- Streams and Rivers
- Wetlands
- Forested Lands



1 0 1 2 Miles





# Site # 10

## Lower East Fork of the White River Watershed – Section 5 Watershed Protection – Lake Monroe

### WETLAND IMPACT TYPES

#### NWI Data

Forested	0 acres
Scrub / Shrub	0 acres
Emergent	<u>0 acres</u>
Total	0 acres

### UPLAND FOREST IMPACTS

30 acres

### MITIGATION

Upland/Bottomland Forests	90 acres
Size of Mitigation	90 acres

### DESCRIPTION

This mitigation site borders Lake Monroe (See map on back). This site is within the Hoosier National Forest purchase boundary and is within 2 miles of Leonard Springs Cave. The purchasing of this property would be an excellent opportunity for protecting summer roosting habitat for the Indiana bat, additional lands for the bald eagle, and the Lake Monroe watershed (See photograph on back for proposed visual representation of mitigation site).

### SPECIES

This mitigation site is targeted for the following:

Federally Listed	Indiana bat	Bald Eagle	
State Listed	Bobcat	Southeastern Bat	Butternut
	Cerulean Warbler	Worm-Eating Warbler	Black & White Warbler
	Hooded Warbler	Sharp-Shinned Hawk	Various Fishes
Other Species	Forest Dependent Birds	Wild Turkey	Deer

### POTENTIAL PARTNERSHIPS

Hoosier National Forest Service	Indiana Department of Natural Resources
United States Fish and Wildlife Service	The Nature Conservancy
Indiana Karst Conservancy	

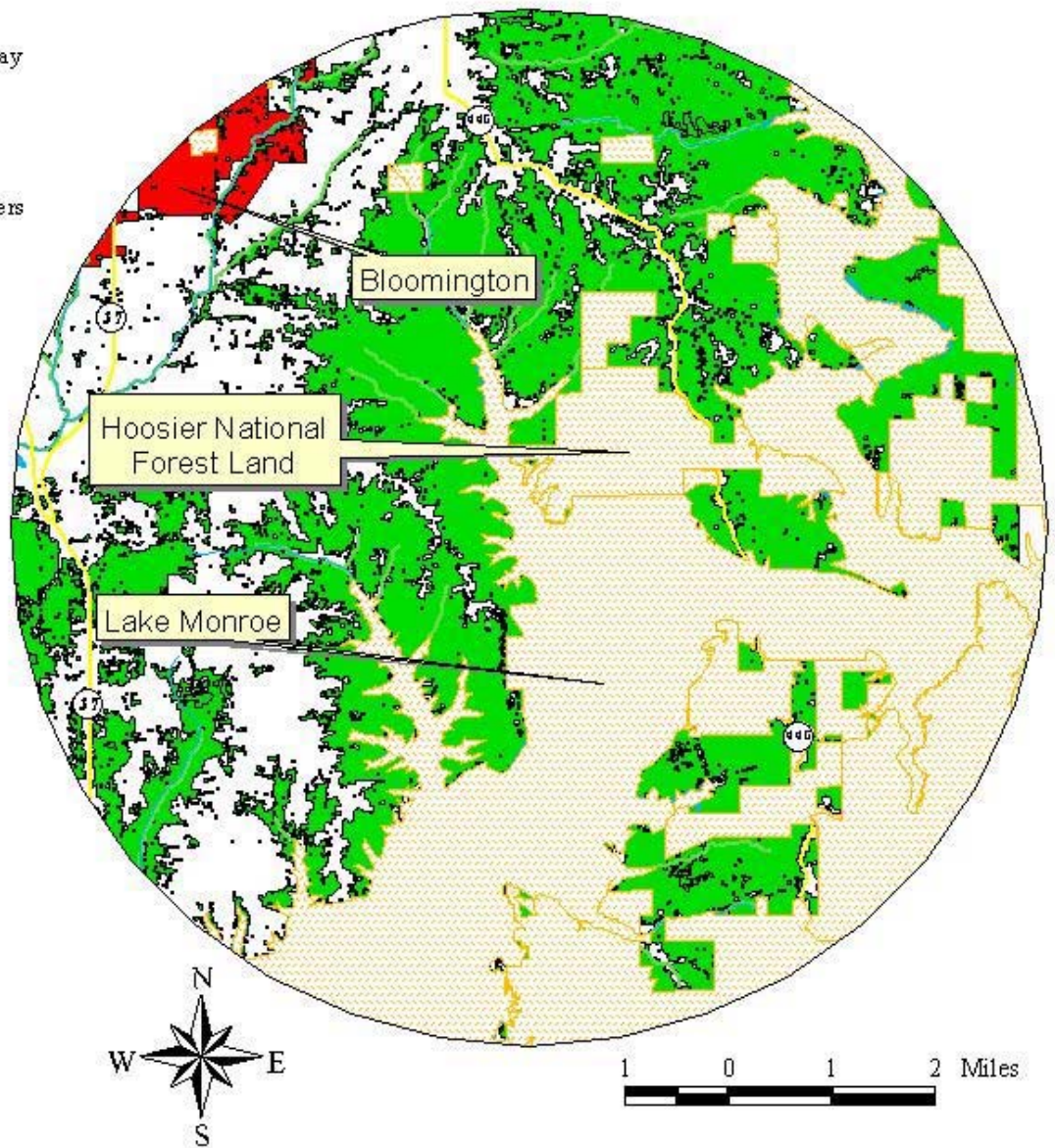
### CONCEPTUAL PLAN

This property is within the Hoosier National Forest purchase boundary. The concept is to protect this area from encroachment by development and the protection of this mature timbered parcel for core forest, watershed protection, and habitat for the Indiana bat and bald eagle.

### MITIGATION TYPE AND THEME

Protection of this forest area is a conservation measure for the population of Indiana bat and bald eagle in the State of Indiana. It may also be used for ospreys. It is a Good Faith Effort by INDOT and FHWA in increasing Indiana bat populations in Indiana. Conservation/Preservation and Education would be the mitigation themes for this site.

- Managed Lands
- Interstate Highway
- US Highway
- State Highway
- Streams and Rivers
- Wetlands
- Forested Lands



# Site #11

## Lower East Fork of the White River Watershed – Section 5 Indiana Bat Conservation – Garrison Chapel Valley

### WETLAND IMPACT TYPES

#### NWI Data

Forested	0 acres
Scrub / Shrub	0 acres
Emergent	<u>0 acres</u>
Total	0 acres

### UPLAND FOREST IMPACTS

95 acres

### MITIGATION

Upland/Bottomland Forests*	300 acres
Size of Mitigation Site (Proposed)	300 acres

### DESCRIPTION

This mitigation site is a 300-acre property in the Garrison Chapel Valley including Coon and Grotto caves (See map on back). Both caves are Priority II hibernacula for the Indiana bat. The number of Indiana bats has doubled in both caves in the last 2 years. In the Garrison Chapel, there are 4 other Indiana bat hibernacula (Buckner, King Blair, Salamander, and Saltpeter). These are Priority III caves that have been declining in numbers due to human influences. The purchasing of this property would be an excellent opportunity for gating these two caves and protecting their vertebrate and invertebrate inhabitants from human disturbances. (See photograph on back for proposed visual representation of mitigation site). The purchasing of Buckner's Cave and/or Leonard Springs Cave to the south would also be most beneficial.

### SPECIES

This mitigation site is targeted for the following:

Federally Listed	Indiana bat		
State Listed	Bobcat	Southeastern Bat	Troglobitic Crayfish
	Butternut	Cerulean Warbler	Worm-Eating Warbler
	Black & White Warbler	Hooded Warbler	Sharp-Shinned Hawk
Other Species	Cave Springtails	Cave Beetles	Cave Pseudoscorpion
	Cave Salamander	Forest Dependent Birds	Wild Turkey

### POTENTIAL PARTNERSHIPS

Indiana Karst Conservancy	Indiana Department of Natural Resources
United States Fish and Wildlife Service	The Nature Conservancy
Sycamore Land Trust	

### CONCEPTUAL PLAN

This 300-acre property including Coon and Grotto caves is forested. The concept is to protect these caves from encroachment by development and the protection of this mature timbered parcel for core forest. These caves will be purchased and the openings gated so as to exclude human disturbances.

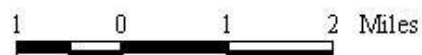
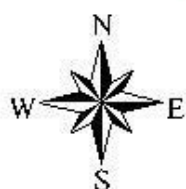
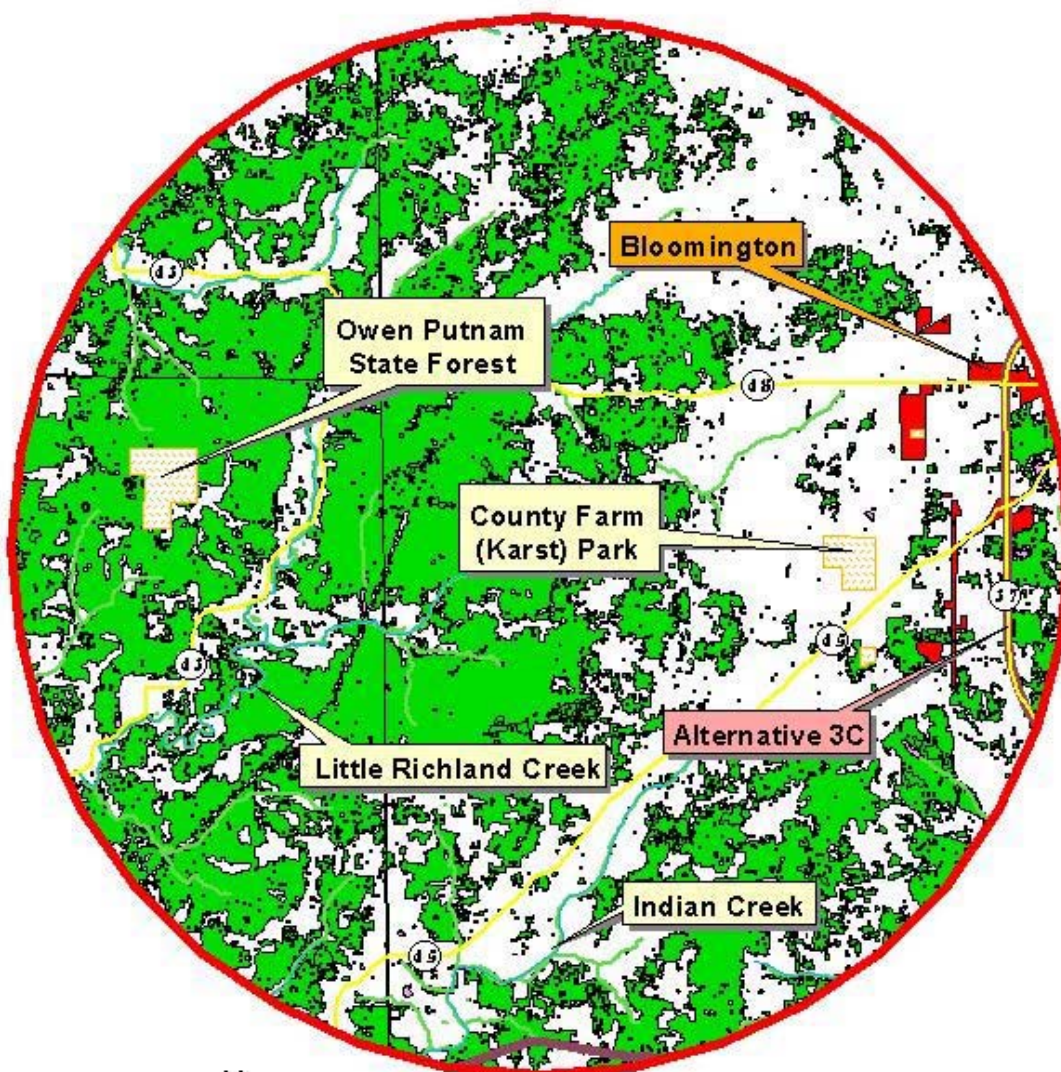
### MITIGATION TYPE

Protection of these two caves is a conservation measure for the population of Indiana bats in the State of Indiana. It is a Good Faith Effort by INDOT and FHWA in increasing Indiana bat populations in Indiana. Conservation/Preservation and Education would be the mitigation themes for this site.

\* Additional Upland/Bottomland Forest is being offered at this site over what is required.



-  Managed Lands
-  Interstate Highway
-  US Highway
-  State Highway
-  Streams and Rivers
-  Wetlands
-  Forested Lands



# Site # 12

## Lower White River Watershed – Section 5 Wetland and Forest Mitigation – Beanblossom Bottoms

WETLAND IMPACT TYPES		NWI Data*
Forested		10.0 acres
Scrub / Shrub		0.0 acres
Emergent		<u>0.0 acres</u>
	Total	10.0 acres

**UPLAND FOREST IMPACTS** 130 acres

### MITIGATION

NWI Wetlands Plus 25% Buffer	40 acres
Upland/Bottomland Forests	390 acres
Size of Mitigation Site (Proposed)	430 acres

**DESCRIPTION** This mitigation site is within the Beanblossom Bottoms (See map on back). Beanblossom Bottoms includes a complex of high quality hardwood wetlands that harbor many unique plants and animals. Mitigation in this area would provide habitat for the bald eagle, Indiana bat, bobcat, and many different species of amphibians and reptiles. (See photograph on back for proposed visual representation of mitigation site).

**SPECIES** This mitigation site is targeted for the following:

Federally Listed	Indiana bat	Bald Eagle	
State Listed	Kirkland's Snake	Northern Crawfish Frog	Sharp-Shinned Hawk
	Bobcat	Rough Green Snake	American Badger
	Henslow's Sparrow	Barn Owl	Bewick's Wren
Other Species	Great Blue Heron	Forest Dependent Birds	Wild Turkey

### POTENTIAL PARTNERSHIPS

Indiana Department of Natural Resources	United States Fish and Wildlife Service
The Nature Conservancy	Sycamore Land Trust

### CONCEPTUAL PLAN

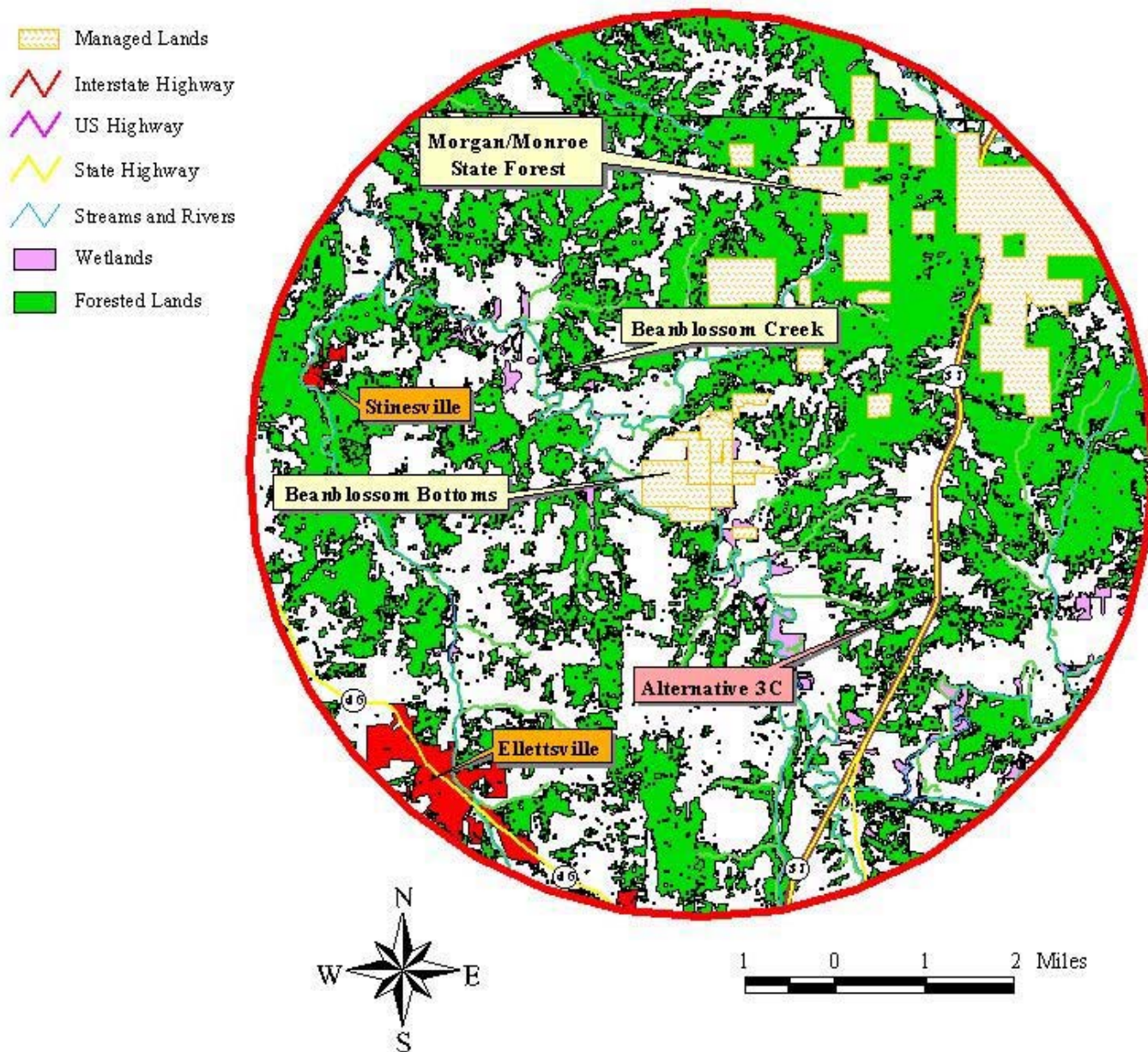
Design for a shallow water, slough-like habitat. Such a habitat would attract ducks and geese along with various-sized wading birds. Of special interest would be whooping and sandhill cranes. Bottomland woods of oak and hickory and emergent wetlands will provide, as appropriate, isolation and protection for shy species.

### MITIGATION TYPE AND THEME

Increasing the size of the Beanblossom Bottoms Wetland Complex will provide a larger habitat for many federal and state listed species. Restoration/Replacement and Education would be the mitigation themes for this site.

\* NWI Impact Areas – Dowden Branch and Dry Branch





# Site # 13

## Lower White River Watershed – Section 5 Wetland and Forest Mitigation – White River (Gosport)

WETLAND IMPACT TYPES		NWI Data*
Forested		5.0 acres
Scrub / Shrub		0.0 acres
Emergent		<u>0.0 acres</u>
	Total	5.0 acres

**UPLAND FOREST IMPACTS** 90 acres

### MITIGATION

NWI Wetlands Plus 25% Buffer	20 acres
Upland/Bottomland Forests	270 acres
Size of Mitigation Site (Proposed)	290 acres

**DESCRIPTION** This mitigation site is near the confluence of Beanblossom Creek with the White River between Stinesville and Gosport (See map on back). The purchasing of this property would be an excellent opportunity for creating riparian buffers along the White River and/or Beanblossom Creek and improving habitat for the Indiana bat and bald eagle (See photograph on back for proposed visual representation of mitigation site).

**SPECIES** This mitigation site is targeted for the following:

Federally Listed	Bald Eagle	Indiana Bat	
State Listed	Kirkland's Snake	Northern Crawfish Frog	Cerulean Warbler
	Red-Shouldered Hawk	Barn Owl	Northern Harrier
Other Species	Great Blue Heron	Forest Dependent Birds	Wild Turkey

### POTENTIAL PARTNERSHIPS

Indiana Department of Natural Resources	United States Fish and Wildlife Service
The Nature Conservancy	Educational Centers / Research

### CONCEPTUAL PLAN

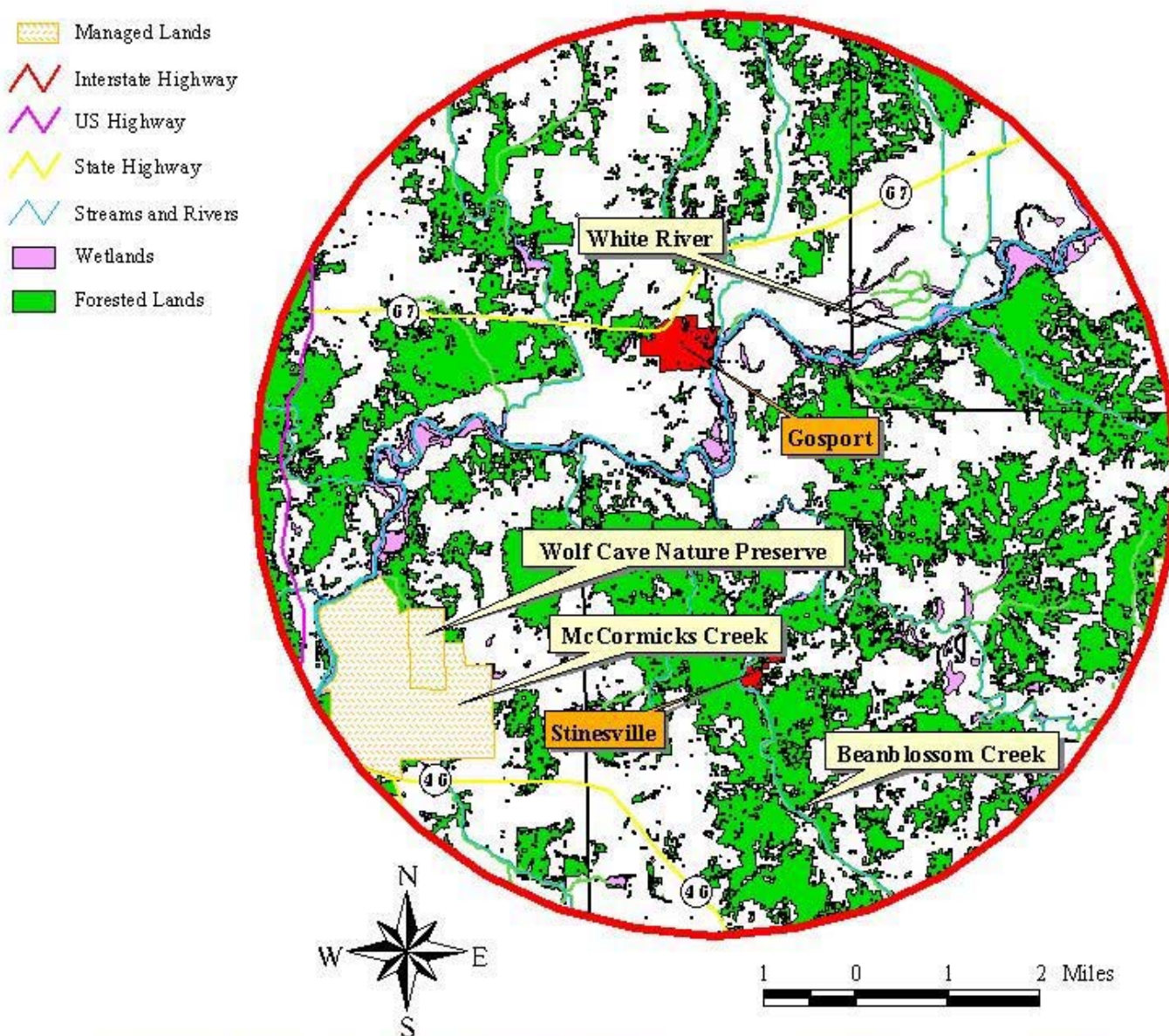
To design a 300-acre bottomland woods with riparian buffers along the White River and/or Beanblossom Creek. Such habitat could be used by the Indiana bat and bald eagle, and improve the water quality of the White River. Improving the water quality may reduce siltation and improve water conditions for mussels in this area of the White River.

### MITIGATION TYPE

Creating bottomland woods, wetlands, and riparian buffers would create a desirable habitat for many federal and state listed species. Restoration/Replacement and Education would be the mitigation themes for this site.

\* NWI Impact Areas – Plummer Creek, Beanblossom Creek, Indian Creek, Little Indian Creek, and Bryant Creek





# Site # 14

## Upper White River Watershed – Section 6 Wetland and Forest Mitigation – Bradford Woods

### WETLAND IMPACT TYPES

#### NWI Data\*

Forested	1.0 acres
Scrub / Shrub	0 acres
Emergent	0 acres
Total	1.0 acres

### UPLAND FOREST IMPACTS

20 acres

### MITIGATION

NWI Wetlands Plus 25% Buffer	5 acres
Upland/Bottomland Forests	60 acres
Size of Mitigation Site (Proposed)	65 acres

### DESCRIPTION

This mitigation site maybe located near Bradford Woods in the vicinity of Sycamore Creek (See map on back). The purchasing of this property would be an excellent opportunity for expanding core forest habitat and providing habitat for the Indiana bat and other forest dependent species (See photograph on back for proposed visual representation of mitigation site).

### SPECIES

This mitigation site is targeted for the following:

Federally Listed	Indiana bat		
State Listed	Bewick's Wren	Four-Toed Salamander	Kirkland's Snake
	Timber Rattlesnake	Worm-Eating Warbler	Black and White Warbler
	Broad-winged Hawk	Northern Harrier	
Other Species	Pileated Woodpecker	Yellow-billed Sap Sucker	Flowering Raspberry
Red Fox	Forest dependent Birds	Wild Turkey	

### POTENTIAL PARTNERSHIPS

Indiana Department of Natural Resources	United States Fish and Wildlife Service
Bradford Woods	Educational Centers / Research

### CONCEPTUAL PLAN

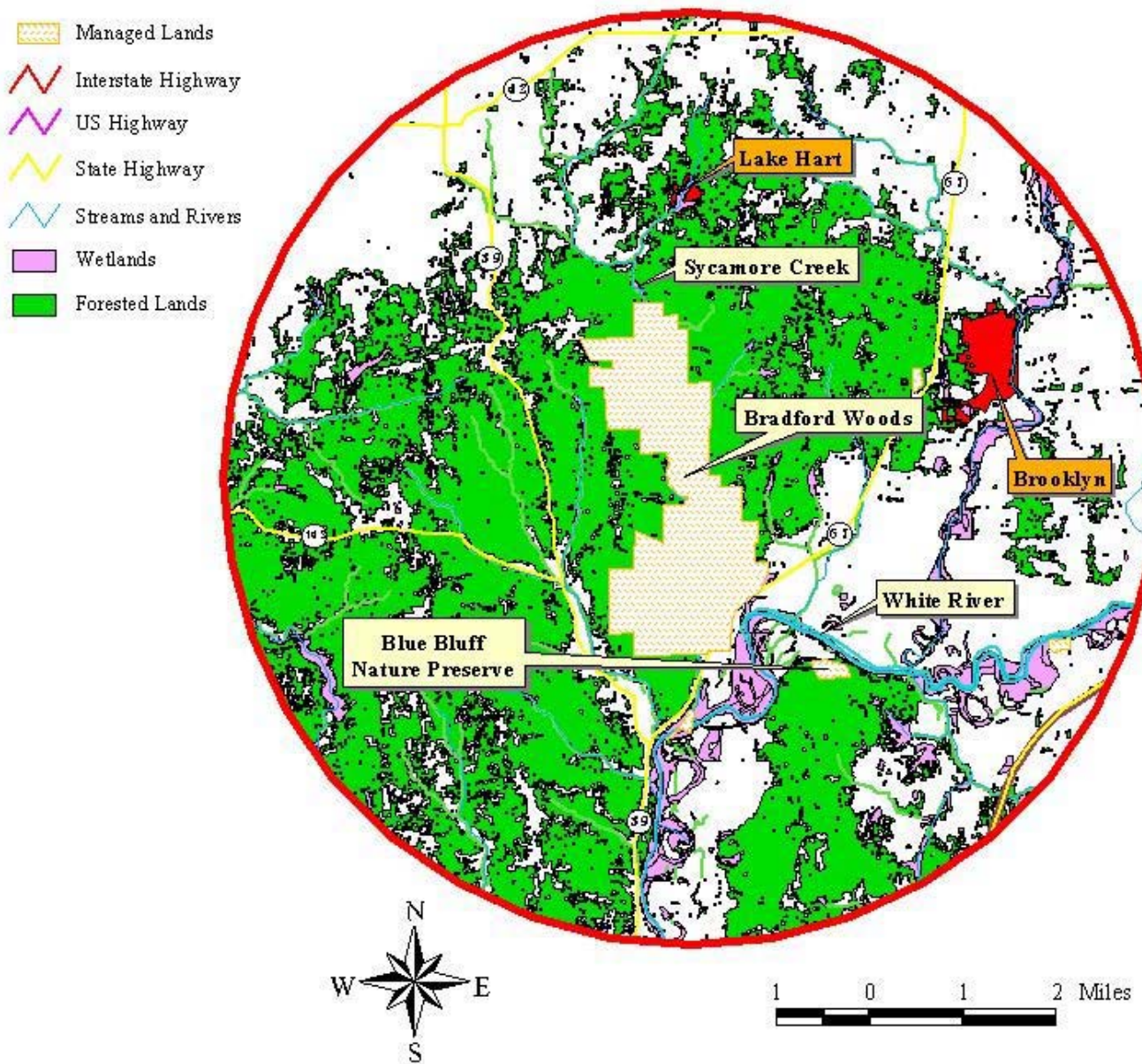
The design of this site is to provide more core forest habitat and thus, more habitat for forest interior birds. This mitigation site would also increase summer roosting habitat for the Indiana bat.

### MITIGATION TYPE

Creating greater core forests in this area would help to attract federal and state listed species. Restoration/Replacement, Conservation/Preservation, and Education would be the mitigation themes for this site.

\* NWI Impact Areas – Clear Creek







# Site # 15

## Upper White River Watershed – Section 6 Wetland and Forest Mitigation – White River (Blue Bluff)

### WETLAND IMPACT TYPES

#### NWI Data\*

Forested	3.5 acres
Scrub / Shrub	0.0 acres
Emergent	<u>2.3 acres</u>
Total	5.8 acres

### UPLAND FOREST IMPACTS

50 acres

### MITIGATION

NWI Wetlands Plus 25% Buffer	20 acres
Upland/Bottomland Forests	150 acres
Size of Mitigation Site (Proposed)	170 acres

### DESCRIPTION

This mitigation area is expected to be along the White River north of Martinsville near possibly Blue Bluff Nature Preserve (See map on back). The Blue Bluff Nature Preserve contains an abundance of the rare shrub flowering raspberry. The preserve also displays a richly varied early spring flora, and a profusion of ferns. There are a few sizeable trees located within the Blue Bluff Nature Preserve. Mitigation near this area would provide and excellent opportunity for providing habitat for the Indiana bat and bald eagle (See photograph on back for proposed visual representation of mitigation site).

### SPECIES

This mitigation site is targeted for the following:

Federally Listed	Indiana bat	Bald Eagle	
State Listed	Evening Bat	American Badger	Barn Owl
	Alligator Snapping Turtle	Henslow's Sparrow	River Otter
Other Species	Blue Herron	Cedars	Flatwoods

### POTENTIAL PARTNERSHIPS

Indiana Department of Natural Resources  
Educational Centers / Research

United States Fish and Wildlife Service

### CONCEPTUAL PLAN

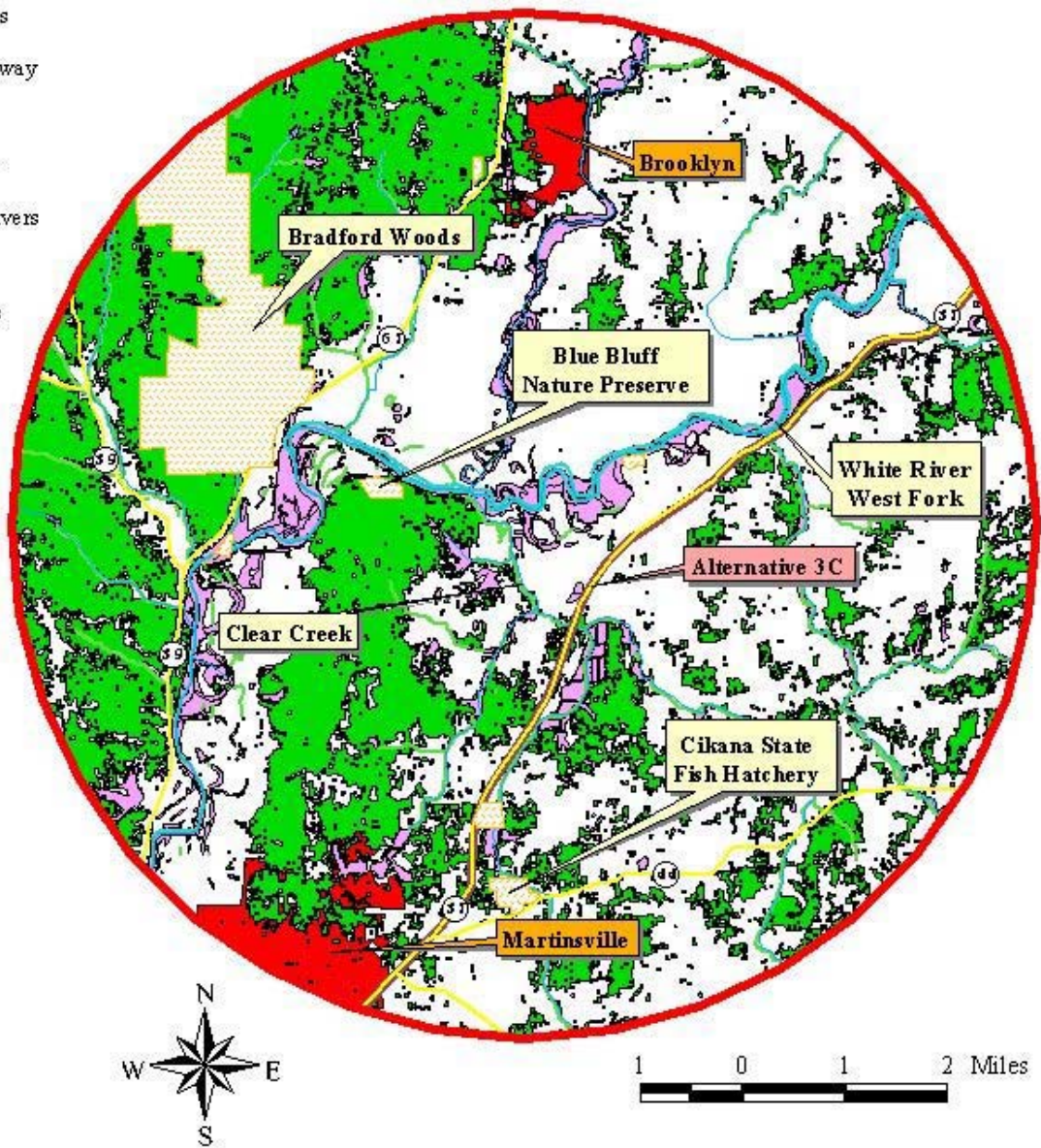
The concept is to restore wetlands and bottomland woods and provide habitat for both aquatic and terrestrial TES species. Similarly, oxbows that dry up in the mitigation site will be dug and connected to the West Fork of the White River. This mitigation would develop habitat for the Indiana bat and bald eagle, and provide for more permanent aquatic ecosystems.

### MITIGATION TYPE

The mitigation site will restore and protect a unique yet dwindling habitat that is the bottomland oxbow ecosystem. Restoration/Replacement, Conservation/Preservation, and Education would be the mitigation themes for this site.

\* NWI Impact Areas – Honey Creek and Orme Ditch

-  Managed Lands
-  Interstate Highway
-  US Highway
-  State Highway
-  Streams and Rivers
-  Wetlands
-  Forested Lands



# Site # 16

## Lower East Fork of the White River Watershed – Section 4 Old Growth Forest - Pioneer Mother's

### WETLAND IMPACT TYPES

#### NWI Data

Forested	0 acres
Scrub / Shrub	0 acres
Emergent	<u>0 acres</u>
Total	0 acres

### UPLAND FOREST IMPACTS

0 acres\*

### MITIGATION

Upland/Bottomland Forest	80 acres
Size of Mitigation	80 acres

### DESCRIPTION

This mitigation site is in Orange County near Pioneer Mother's Memorial Forest (See map on back). This site is within the Hoosier National Forest purchase area and is within a karst area. The purchasing of this property would be an excellent opportunity for increasing summer habitat for the Indiana bat and core forest habitat. The Pioneer Mother's Memorial Forest was first established in 1816 (See photograph on back for proposed visual representation of mitigation site).

### SPECIES

This mitigation site is targeted for the following:

Federally Listed	Indiana bat		
State Listed	Bobcat	Southeastern Bat	Butternut
	Cerulean Warbler	Worm-Eating Warbler	Black & White Warbler
	Hooded Warbler	Sharp-Shinned Hawk	
Other Species	Forest Dependent Birds	Wild Turkey	Deer

### POTENTIAL PARTNERSHIPS

Hoosier National Forest	Indiana Department of Natural Resources
United States Fish and Wildlife Service	The Nature Conservancy
Indiana Karst Conservancy	

### CONCEPTUAL PLAN

This property is within the Hoosier National Forest Purchase Boundary. The concept is to protect this area from encroachment by development and the protection of this mature timbered parcel for core forest and old growth woods. Similarly, there is summer roosting habitat for the Indiana bat in this area.

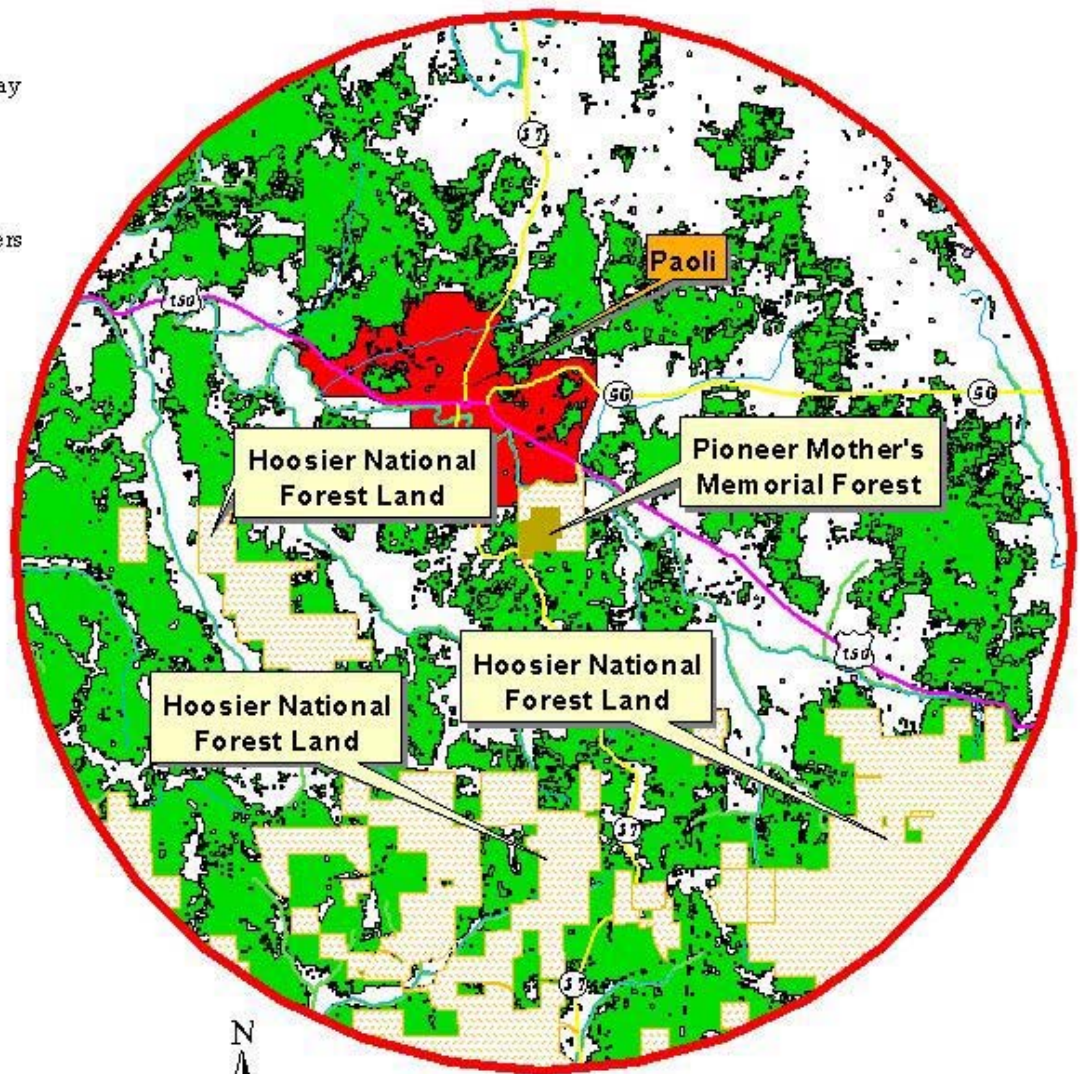
### MITIGATION TYPE THEME

Protection of this forest area is a conservation measure for the population of Indiana bats in the State of Indiana. It is a Good Faith Effort by INDOT and FHWA in increasing Indiana bat populations in Indiana, and the value of old growth woods. Conservation/Preservation and Education would be the mitigation themes for this site.

\* This conservation area is outside the Action Area. No impacted acres are being mitigated for this area. This conservation site is a "Good Faith" effort by INDOT to increase and protect old growth forest habitat in Southwestern Indiana.



- Managed Lands
- Interstate Highway
- US Highway
- State Highway
- Streams and Rivers
- Wetlands
- Forested Lands



1 0 1 2 Miles





# Site # 17

## Lower East Fork of the White River Watershed – Section 4 Karst Mitigation – Lost River (Orangeville)

### WETLAND IMPACT TYPES

#### NWI Data

Forested	0 acres
Scrub / Shrub	0 acres
Emergent	<u>0 acres</u>
Total	0 acres

### UPLAND FOREST IMPACTS

0 acres\*

### MITIGATION

Upland/Bottomland Forests	1,100 acres
Size of Mitigation Site (Proposed)	1,100 acres

### DESCRIPTION

This mitigation site is in Orange County in the vicinity of Orangeville (See map on back). This site is privately owned and within the Hoosier National Forest purchase boundary. It is mostly wooded with several caves, ponds, and other karst features. It's significance is to protect one of the best cave and karst systems in the state. The purchasing of this property would be an excellent opportunity for protecting core forest habitat too (See photograph on back for proposed visual representation of mitigation site).

### SPECIES

This mitigation site is targeted for the following:

Federally Listed	Indiana bat		
State Listed	Bobcat	Southeastern Bat	Butternut
	Cerulean Warbler	Worm-Eating Warbler	Black & White Warbler
	Hooded Warbler	Sharp-Shinned Hawk	Troglobitic Crayfish
Other Species	Forest Dependent Birds	Wild Turkey	Deer
	Cave Springtails	Cave Salamander	Cave Beetles

### POTENTIAL PARTNERSHIPS

Hoosier National Forest	Indiana Department of Natural Resources
United States Fish and Wildlife Service	The Nature Conservancy
Indiana Karst Conservancy	

### CONCEPTUAL PLAN

This property is within the Hoosier National Forest purchase boundary. The concept is to protect this area from encroachment by development and the protection of both karst and core forest habitat. The purchase of this property would protect many species dependent upon karst. It has many similarities with Tincher Pond which has many endemic karst species. The protection of this 1,100-acre wooded area would protect summer, fall/spring, and possibly winter habitat for the Indiana bat.

### MITIGATION TYPE AND THEME

Protection of this forested and karst area is a conservation measure for the population of Indiana bats in the State of Indiana. It is a Good Faith Effort by INDOT and FHWA in increasing Indiana bat populations in Indiana. Conservation/Preservation and Education would be the mitigation themes for this site.

\* This conservation area is outside the Action Area. No impacted acres are being mitigated for in this area. This conservation site is a "Good Faith" effort by INDOT to protect karst features, karst habitat, and karst dependent species in Southwestern Indiana.

-  Managed Lands
-  Interstate Highway
-  US Highway
-  State Highway
-  Streams and Rivers
-  Wetlands
-  Forested Lands

